

The Mining Journal

RAILWAY AND COMMERCIAL GAZETTE.

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 613.—VOL. XVII.

London, Saturday, May 22, 1847.

[PRICE 6D.

MINING MATERIALS FOR SALE.

MR. GEORGE SEALY is instructed to OFFER FOR SALE, BY AUCTION, on Tuesday, the 26th inst., at WHEAL VIRGIN, in the parish of ST. HILARY, the following valuable

MINING MATERIALS—VIZ.:

1. 60-inch cylinder STEAM-ENGINE, 10-feet stroke in the cylinder, and 9-feet in the shaft, with steam case and three boilers, weighing 30 tons.
1. 19-inch cylinder STEAM WHIM-ENGINE, with boiler, cast-iron cage, &c., complete.
CRUSHING APPARATUS, consisting of cast-iron chairs, rolls, arbours, braces, wood frame-work, &c., complete.
24. 9-feet 14-inch PUMPS; 17 9-feet 13-inch ditto; 1 9-feet 12-inch ditto; 18 9-feet 11-inch ditto; 12 9-feet 10-inch ditto; 7 9-feet 9-inch ditto; 10 9-feet 8-inch ditto, and 6 9-feet 6-inch ditto.
2. 11-feet 14-inch PLUNGER POLES; 1 9-feet 12-inch ditto; 1 11-feet 10-inch ditto; 1 9-feet 6-inch ditto; and 1 11-feet 6-inch ditto, with pole-cases, stuffing-boxes, glands; H and top-doorpieces, cleats, and window-bars, to match each pole.
1. 7-feet 5-inch windpore; 1 9-inch clock-doorpiece; 1 10-inch top-doorpiece.
60 fathoms 13-inch Memel rods, with forged strapping-plates and pins to match.
Several tons common iron strapping-plates, and pins to fit; 8 and 9-inch wood rods.
Large quantity of staples and glands, of various sizes; large capstan and shears.
2. Balance-holes, and 2 angle ditto.
Several tons railroad iron and saddles, railroad wagons, large quantity of wrought and cast-iron, about 4 tons chain, smith's bellows and anvil, old brass, and a great variety of other articles.

The attention of parties engaged in the working of mines is earnestly requested to the foregoing announcement, as the whole of the materials will be found to be in excellent condition; and the proximity of Wheal Virgin to the ports of Hayle and Marazion will enable purchasers who may want to remove the articles from the neighbourhood to do so at a very moderate expense.

The sale will commence precisely at Eleven o'clock.

Dated Wheal Virgin, near Goldsithney, May 4, 1847.

MINING MATERIALS FOR SALE.—TO BE SOLD, BY PUBLIC AUCTION.

ON FRIDAY, the 26th day of May inst., by Mr. PRYOR, at PONTRATH, in the parish of Illogan, a quantity of MINING MATERIALS, consisting of an oak water-wheel, 25-ft. diameter, 23-in. breast, cast-iron sockets, with crank, blocks, guides, saddle, &c., one 9-ft. 8-in. pump, two 6-ft. 8-in. ditto, eight 9-ft. 9-in. ditto, two 9-ft. 10-in. ditto, one 6-ft. 6-in. door-piece and door, one 6-ft. 8-in. bucket door-piece and door, one 7-ft. 7-in. working barrel, one 6-ft. 6-in. windpore, one 3-ft. 10-in. wood mastinding-piece, one crab-wheel, sundry bars of iron, whin ropes and lashings, smiths' bellows, anvil, and vice, smiths' tools, sundry plates and tags, braces, flanch bolts, &c., and various other articles suitable for mining purposes.

The above materials are confidently recommended to the notice of mine adventurers and others, and the whole will be promptly sold. —Dated Comford, May 12, 1847.

MINING MATERIALS—VIZ.:

A 49-in. cylinder STEAM-ENGINE, 9-ft. stroke in shaft, with boiler complete; 18 9-ft. 10-in. pumps; 1 6-ft. 13-in. ditto; 1 9-ft. 7-in. ditto; 1 44-ft. 9-in. ditto; 2 9-ft. 9-in. windpores; 2 7-ft. 8-in. ditto; 1 10-ft. 9-in. working barrel; 1 9-ft. 9-in. ditto; 1 6-ft. 10-in. door-piece; 1 9-ft. 8-in. stuffing-box and gland; 1 9-ft. 7-in. plunger pole; 1 9-ft. 8-in. H-piece; 1 9-ft. top door-piece; sundry staples and glands; flat-rod shovels; horse whims; whin chain; large beam, scales and weights; large cistern; a quantity of launders, with stays; water barrels; smith's anvil; mandrill; smith's chest, &c. &c.

The whole of the above will be positively sold to the highest bidder; and the Auctioneer begs to call the attention of mine agents and purchasers of mine materials generally to this sale.

Also, to be sold by private contract, a 70-in. CYLINDER STEAM-ENGINE, with brass air-pump, bucket, and three boilers, about 33 tons, now at South Towan Mine, in the parish of St. Agnes.

For further particulars, apply to Messrs. Hocking and Loam, Engineers, Redruth; or to Mr. PRYOR.—Dated Comford, May 12, 1847.

SHARES IN LEAD MINES, NEAR KETTLEWELL, LEYBURN, &c.

MR. JOHN HEPPER has received instructions from the executors of the late Mr. John Charlesworth TO SELL, BY AUCTION, AT THE GOLDEN LION HOTEL, LEEDS, on Tuesday, the 1st day of June, 1847, subject to such conditions as may be then and there produced.

TWO (14th) SHARES in the VICTORIA MINE, near Kettlewell.

ONE (16th) SHARE in the GENTLEWOMAN MINE, near Kettlewell.

TWO (20th) SHARES in the NORTH MOSDALE MINE, Coniston Moor.

FOUR (18th) SHARES in the KELL HEAD MINE, Wensleydale, near Leyburn.

For further particulars apply to Mr. Charlesworth, Headingley, near Leeds; or to the auctioneer.—Sale to commence at Seven o'clock in the evening prompt.

TO PROPRIETORS OF WATER-WORKS, MINES, &c.—FOR SALE, a LARGE PLUNGER LIFT, consisting of—

10 9-feet 23-inch pump trees
12-feet matching-piece, 28 inches diameter, diminishing to 23 inches.
1 16-ft. plunger-pole, 28 inches diameter.
1 7-feet working-barrel, 28 inches diameter, with stuffing-box and gland.
1 H-piece, with door and clacks, complete.
1 6-feet windpore, 28 inches diameter.
Ring flange-pins, and nuts to fit.

The whole length of the lift is about 17 fathoms; it is as good as new, and will be sold, delivered on the quay at Aberystwith, at 7s. 6d. per cwt. for the whole of the cast-iron parts, and 30s. per cwt. for the wrought-iron work.

Application to be made to George Fossett, Esq., Aberystwith; or John Taylor, Jun., Esq., 3, Duke-street, Adelphi, London.—Dated May 5, 1847.

TO BE SOLD, BY PRIVATE CONTRACT, at GODOL-

PHIN MINES, ONE 60-inch PUMPING-ENGINE, 10 feet stroke in cylinder, and 9 feet in the shaft, with three tubular boilers, 34 tons, balance-hob, and first piece of rod. ONE 26-inch PUMPING-ENGINE, 6 feet stroke, equal beam, boiler, 8 tons, balance-hob, and first piece of rod.

ONE 24-inch STAMPING-ENGINE, 8 feet stroke, boiler, 11 tons.

ONE 24-inch WHIM-ENGINE, 6 feet stroke, boiler, 4 tons, and cage.

ONE 18-inch WHIM-ENGINE, 4 feet stroke, boiler, 7 tons, and cage.

Application to be made to Capt. R. Williams, on the mines.

Dated Godolphin Mine, Helston, Cornwall, May 7, 1847.

SIXTY AND THIRTY-INCH CYLINDER STEAM-ENGINES FOR SALE.—TO BE SOLD, BY PRIVATE CONTRACT, a 60-inch cylinder STEAM-ENGINE, 8-ft. stroke, now at STRAY PARK MINE, in the parish of Camborne. Also, an excellent 30-in. cylinder STEAM-ENGINE, 10-ft. stroke in cylinder, and 9-ft. in the shaft, with a boiler, about 10 tons, space pipes, &c., complete, at WHEAL KALE MINE, in the parish of Phillack. This engine is quite new, and was manufactured by the Messrs. Harvey, Hayle Foundry.

For particular and to treat for the same, apply to William Vawdrey, Esq., Penpol House, Hayle; or to Mr. Francis Pryor, Mine Broker, Auctioneer, and General Agent, Comford, Gwennap.—Dated Comford, May 12, 1847.

ON SALE, BY PRIVATE CONTRACT, at the PROVINCIAL MINES, near ST. IVES, an excellent 30-inch cylinder STEAM PUMP-ENGINE, with boiler, about 7 tons.—For duty performed, see *Leam's Reporter*, 1844 and 1845.

50 Fathoms 9-inch PUMPS, 30 fathoms 8-inch ditto, and other sizes.

1 8-inch doorpiece, 1 8-inch ditto.

Rod-pipes, feed-off bars, rod-shovels, whin-shovels, shaft rollers, bucket-door, windpores, and a variety of other articles.

Apply to Capt. Penberthy, on the mines; or Samuel Higgs and Son, Penzance.

Dated March 10, 1847.

ON SALE—COLLIERS, near BISHOP AUCKLAND, in the county of DURHAM.—TO BE SOLD, BY PRIVATE CONTRACT, the UNEXPIRED TERM, held by the present lessees, in the GORDON and EVERWOOD COLLIES. The above collieries are now in work, and are so situated as to command a considerable export, as well as land sale, trade. These advantages will be materially increased by the formation of the Auckland Branch of the York and Newcastle Railway, and the new railways leading to the south and west—for all of which Acts are obtained. By the first, great facilities will be obtained for shipments on the Tyne and Wear.

For further particulars apply to Mr. Brogden, Stockton-on-Tees.

TO LET, A VALUABLE COLLIERY, and a FIELD OF

BLACK and CLAY-BAND IRONSTONE, on the Estate of PRESTONGRANGE, near the village of Prestongrange, situated about eight miles from Edinburgh, and intersected by the line of the North British Railway.

The COAL and IRONSTONE are in the same field, and a shaft has been sunk, and the ironstone at a depth of 36 fathoms from the surface, and the coal at a depth of 34 fathoms.

The BLACK-BAND IRONSTONE is about 20 inches thick, with 4 inches of Farrow Coal, and 8 inches of Clay-band Ironstone—forming in all, with some shale interposed, a seam of about 4 feet thick. According to an analysis, by Professor Johnston, the black-band contains about 27 to 32 per cent. of metallic iron, and the clay-band about 36 per cent. On application specimens of the iron, and raw or calcined, will be sent to inquire.

There are rails laid from the mouth of the shaft to a siding on the North British Railway, and there is a safe and commodious shipping harbour belonging to the proprietor.

Application may be made to the proprietor, Sir George Grant Suite, Prestongrange, by Prestongrange. The houses of Prestongrange and the works are both within a mile of the Tiverton Station on the North British Railway.

CASTLE DINAS LEAD MINE, IN THE COUNTY OF CARDIGANSHIRE.

Divided into 3000 shares—limited to £10 each, and carried out on the Cost-book System, with a deposit of £2 10s. per share.

That a committee be appointed, to consist of not less than five, nor more than seven, adventurers, or shareholders; and that each member of such committee shall, at the time of his election, and during his continuance, hold, and continue to hold, not less than 25 shares in the said company; and that such committee be appointed by the shareholders, at a meeting to be held for that purpose, and for the nomination of all officers.

This mine is situated in the parish of Strata Florida, otherwise Caron McClelland, near the Great Ynyddy, the Llwyn Mall, Bryn, Berthlin, Cwymysith, Llanfair, and several other of the richest mines in the county of Cardigan, extending under a surface of 117 acres.

The lodes of the different mines in the neighbourhood are supposed to run through the whole of this property.

The proprietor has, at his own expense, driven an adit level, upwards of 100 yards, and, so far as the lode has been developed, it is of the most flattering description, and holds out the prospect of an immediate return.

The lodes run east and west, varying from 1 to 6 feet wide—producing lead, muriatic, copper, and zinc.

One of the great advantages of this mine is the natural facility it affords for working the mine, without the aid of steam-power—thus insuring to the company a saving of several hundreds per year: its proximity to an ever-endless stream of water, running through the entire property, available for, and capable of, working, washing, and crushing the ore, and all other necessary purposes, at a trifling expense.

This mine is situated within 16 miles of the port of Aberystwith, from which all the ore in the neighbourhood is shipped.

The royalty, or dues, will be 10th, according to the custom of the county.

Applications for shares, and further particulars, apply to Mr. B. Cook, mineral agent, Bradford-street, Birmingham.

INCROSTATIONS IN BOILERS.—The ADVERTISER is in possession of a METHOD of entirely PREVENTING the DEPOSITION OF INCROSTATIONS MATTER in BOILERS, whether marine or otherwise; not only is it capable of accomplishing the above, but it also removes deposits already formed.

The chief merits of this method are—firstly, it can be by no possibility injuriously affect the boiler or machinery, as no corrosive vapour is given off, or any substance employed, capable of acting on any metal; secondly, the expense of the material is almost nominal.

Any party wishing to treat for the above, may address to "A. Z." care of the Editor, *Mining Journal* Office, 26, Fleet-street, London.

SULPHUR.—TO BE SOLD, RODGERS'S PATENT FOR THE SEPARATION OF SULPHUR FROM MINERAL SUBSTANCES. Apply to Mr. PHILLIPS, 2, Duke-street, Adelphi, London.

WANTED—A SUPERINTENDENT OF IRON-WORKS. in the UNITED STATES OF AMERICA. The works combine every advantage of position, and are already on the scale of three blast-furnaces, with fineries, forge, rolling-mill, foundry, &c. A minimum salary of £700 a-year will be paid, with dwelling-house, and a per centage on realised profits—estimated, under efficient management, to average £20,000 a-year. No party will be treated with who cannot produce satisfactory testimonials of decided capacity and integrity, combined with practical experience, in the management of extensive and successfully conducted iron-works.—Applications, which will be considered confidential, may be addressed to Messrs. Palmer and Nettlefold, 4 Trafalgar-square, London.

TENDERS FOR WELSH COAL AND NORWAY TIMBER.—TENDERS may be FORWARDED to ME, on or before the 10th proximo, for SUPPLYING from TWO THOUSAND to THREE THOUSAND TONS, as I may require, of WELSH COAL, of the best quality, for STEAM-ENGINES, to be delivered over the ship's side, at Looe, on a wharf, or into barges, between Midsummer, 1847, and Midsummer, 1848, in about equal quantities monthly, and so that the mines for which the coal is wanted shall be kept constantly supplied, in default of which, and also of the quality being the best, the extra cost (above the contract price) of obtaining a supply elsewhere, to be charged to the contractors. Payment to be made upon the quantity invoiced, unless the purchaser shall choose to have any cargoes weighed, and such cargoes shall prove deficient, in which case twice the quantity deficient shall be deducted from the quantity invoiced; the mode of payment to be by acceptance, at the end of two months, for the supplies of the previous two months. The tenders to state of what pit the coal is offered, and the invoices to certify that the coal is from such pit.

TENDERS may also be FORWARDED to ME, on or before the 10th proximo, for SUPPLYING the following mines—viz.: West Caradon, Gwamena, Craddock Moor, Tokenbury, Wheal Sisters, and Wheal Mary Consols, and also any small mines adjoining to, or within a mile of, any of the foregoing, for 12 months, from Midsummer next, with NORWAY TIMBER, half Drift and half Longwood, of good quality and average lengths, to be delivered at the respective mines free of expense, in such quantities as may be required, and when required, to be charged at the measurement on which the duty has been paid. Any mine, or mines, may be tendered for separately.

Should the agents not approve of the quality of any timber sent in, the contractors to remove the same; and, at the option of the respective adventurers, either replace it by an article of approved quality, or submit to a deduction from their bills of the amount of difference between the contract price and that at which the adventurers may obtain a supply from some other party; also, the amount of the like difference to be deducted from the contractors' bills in respect of timber purchased elsewhere, in consequence of the contractors not sending in supplies when and as required. Payment for timber by acceptance, at four months, from time of the bills being audited by the adventurers.

Liskeard, 14th of fifth month (May), 1847. EDWARD A. CROUCH.

TO IRONFOUNDERS, ENGINE MANUFACTURERS, &c.—BEST BAR, SHEET, BOILER-PLATE, ROD, and HOOT IRON, direct from the WORKS, in STAFFORDSHIRE: also, SCOTCH, WELSH, and STAFFORDSHIRE PIG IRON.—Apply to T. M. GLADSTONE & CO., 7, Birch-lane, City.

TO IRON AND COAL MASTERS.—S. B. ROGERS, of NANTYGLYD, MONMOUTHSHIRE, respectfully begs to announce to IRON and COAL MASTERS, that he has DISCOVERED some very great IMPROVEMENTS in the CONSTRUCTION of COKE OVENS, whereby a SAVING of full TWENTY PER CENT. may be effected in the conversion of small coal into coke.—The cost of ovens, and other particulars, communicated in reply to pre-paid letters, addressed as above.

WILSON & FRASER, 2, WELLINGTON-BUILDINGS, LIVERPOOL, and 13, EXCHANGE-PLACE, GLASGOW, have always ON SALE PIG-IRON, BAR-IRON, RAILWAY CHAIRS, and RAILWAY BARS.

MR. R. TREDDINICK, MINING AGENT AND DEALER IN EVERY DESCRIPTION OF SHARES. THREE KING'S COURT, LOMBARD-STREET, LONDON.

THOMAS P. THOMAS, MINE AGENT, AND DEALER IN RAILWAY AND OTHER SHARES. 18, THREADNEEDLE-STREET, LONDON.

MINING OFFICES, 1, ST. MICHAEL'S-ALLEY, CORNHILL, LONDON.

WATSON AND CUELL, MINE AGENTS.—N.B.—STATISTICAL INFORMATION furnished (on application) to SHARE-HOLDERS in MINES in Cornwall, Devon, Scotland, Ireland, and Spain.

WILLIAM H. SMITH, MINING SHARE AGENT, 10, WARFORD-COURT, THROGMORTON-STREET, LONDON.

shares FOR SALE in the following MINES—viz.:

WHEAL LOUISA, ALBERT CONSOLS, WHEAL BLENCOE, WEST SHEPHERD, WHEAL MARY PENTUAN, VICTORIA TIN MINING COMPANY.</

NO BREWING UTENSILS REQUIRED.

PATENT CONCENTRATED MALT AND HOP EXTRACT

enables PRIVATE INDIVIDUALS to MAKE

FINE HOME-BREWED ALE,

WITHOUT EMPLOYING ANY BREWING UTENSILS.—It has only to be dissolved in hot-water and fermented.—Sold, in jars, for medicinal and other purposes, at 1s. and 1s. 6d.; and in bottles for brewing 9 to 15 gallons and upwards of ale, at 6s. 6d. and 12s. 6d. each, by the

BRITISH NATIONAL MALT EXTRACT COMPANY,

7, NICHOLAS-LANE, LOMBARD-STREET; Petty, Wood, and Co., 38, Threadneedle-street; Wix and Sons, 22, London-street; Batty and Co., 15, Finsbury-pavement; De Castro and Peach, 65, Piccadilly; Hoskin and Co., 38, Duke-street, Manchester-square; and oilmen and grocers generally.

Also, just published, and may be had gratis,

NATIONAL BREWING: A GUIDE TO THE USE OF CONCENTRATED MALT AND HOP EXTRACT, for BREWING and WINE MAKING; to which is added, MEDICAL OPINIONS relative to the virtues of malt and hops.

Transactions of Scientific Bodies.

MEETINGS DURING THE ENSUING WEEK.

Society.	Address.	Day.	Hour.
Royal Botanic	Inner Circle, Regent's-park	Saturday	3 P.M.
Western Scientific Institut.	Leicester-square	Monday	8 P.M.
Geographical	3, Waterloo-place	Monday	1 P.M.
Medical	Bolt-court, Fleet-street	Monday	8 P.M.
Linnæan	Soho-square	Monday	1 P.M.
Medical and Chirurgical	53, Berners-street	Tuesday	8 P.M.
Zoological	11, Hanover-square	Tuesday	3 P.M.
Society of Arts	Adelphi	Wednesday	8 P.M.
Geological	Somerset-house	Wednesday	8 P.M.
Royal Society Literature	4, St. Martin's-place	Thursday	4 P.M.
Royal Institution	Albemarle-street	Friday	8 P.M.
Philological	Lond. Lib., 12, St. James's-sq.	Friday	7 P.M.

INSTITUTION OF CIVIL ENGINEERS.

MAY 4 and 11.—Sir J. RENNIE (President) in the chair.

The discussion upon Mr. Frodsham's paper, "On the Isochronism of the Balance-spring of Chronometers," occupied nearly the whole of the former evening. The viscosity of the oil, from its nature and from external causes, and the bad effects arising from it, were dwelt upon at great length; but, it did not appear, that either chemistry, or the practical experience of working time-makers, had as yet pointed out the true causes of viscosity, or enabled its effects to be satisfactorily remedied. The relative values of various modes of trial of timekeepers were also dilated upon. It was attempted to be shown, but was successfully refuted, that a taper spring would produce the same effect as the isochronism arrangement, and that the tapering could be effected by machinery. Among the external influences affecting the oil in time-keepers, was mentioned the circumstance of the watches belonging to George III., which, being kept in drawers of cedar wood, soon stopped, and it was found that the oil had changed into a substance resembling gum. Attempts had been made to substitute oil of sweet almonds for olive oil, on the recommendation of a distinguished chemist, but they were signal failures. The inefficiency of the remontoir movement was clearly shown, although its ingenuity was fully admitted. Throughout the discussion the great merit of Arnold's improvements seemed to be recognised, and it was generally deplored that a spirit of empiricism has been allowed to stop the progress of so beautiful a science as that of the construction of time-keepers. It was, however, to be hoped that, by the facility afforded by the Institution of Civil Engineers of making known ingenious and recognised improvements, more particular accounts of what was done would be given to the world, and the merits of the scientific constructors of that indispensable instrument, the chronometer, would become generally known.

The paper read was "An Account of the Progressive Improvements in Sunderland Harbour and the River Wear," by Mr. J. Murray, Mem. Inst. C.E. The memoir commenced with an account of the coal trade, licences having been granted by King Henry III., in 1236, "to the good men of Newcastle, to dig coals and stones in the common soil of the town and outside the walls." In 1284, permission was given to export the produce of the mines. During the civil war in 1644, the export from Sunderland was greatly increased, as no coals were permitted to be brought from Newcastle to London, on account of that town being a stronghold of the royalist party. Between 1704 and 1711, the annual report had reached 174,254 tons; and that of the last year, 1846, was 1,500,000 tons. The census, in 1802, gave 19,100 inhabitants, whilst the town at present contains upwards of 60,000 persons. The management and improvement of the River Wear was natural an object of great solicitude, as its entrance was a much example. In 1669 Charles II. granted a patent to E. Andrew, to build a pier, and erect light-houses, and forbade the casting of ballast, &c., into the river. An act was obtained in 1717, appointing river commissioners for the conservancy of the harbour, &c., giving power to raise money by tonnage duty on ships entering the port. The jurisdiction of the commissioners is limited by the last acts to an extent of about 11 miles, between Biddock Ford, above the town, and to a distance out to a depth of five fathoms at low water. Little was done to improve the river until 1719; at that time the entrance was very intricate, and the two main channels were both very shallow. The south pier was commenced in 1723, and for the purpose of directing the full force of the current against the bar. Buseley and Thompson, publicans in 1737, still the bad state at that time. Labdy (the engineer of Westminster-bridge) was called upon for his advice in 1748. He pointed out the principal causes of the then state of the river, and suggested the contraction of the channel at the worst places, so as to increase the scouring power of the stream, deepening the sill, by manual labour, and by dredging engines, and constructing a north pier, so as to leave a distance of 300 yards between the point of that and the south pier. He stated, however, that, "after all, no man can foresee the consequences of erecting the north pier, if it causes a greater obstruction; if removed, is made unbait and taken up." He recommended also throwing all the force of the stream into one channel, and cutting away the bar by ballast engines, and cautioned the commissioners against over permitting jetties or locks to be placed upon their river. Mr. Vincent of Scarborough, was appointed engineer to the trust in 1752. Mr. Robin succeeded him in 1755, and under them the south channel was so much improved that the north channel was warped up, with sand. Mr. Smith, of Sheffield, proposed further improvements in 1758. Mr. Wooller also reported in 1767 on Mr. Robin's plan of building mole on the north and south rocks. The work was commenced, and was abandoned, for reasons which do not appear. Mr. R. Shout was appointed in 1779; and in 1780, Mr. Smeaton's advice was sought. He recommended the prolongation of the piers on Mr. Shout's plan. The consequence of this constant extension of the south pier seems to have been the warping up of sand into the harbour's mouth. Two timber jetties were, therefore, suggested by Mr. Shout in 1786, and were the origin of the present north pier. The effects produced were very beneficial, as in a few months a deep and spacious channel was formed by the rush of the waters. The timber work was then cast with stone, and the work was continued by Mr. Pilkerton, who succeeded Mr. Shout in 1795. He also erected the light-house at the point of the pier. The south pier was also extended. Mr. R. Doddi also reported on the works, and recommended chiefly the formation of a wet dock on the present Potato Girth. Mr. M. Shout became the engineer in 1804, and he reduced some of the old works, whilst he extended the north pier. Mr. Jessop made a report in 1807, recommending further extension of the south pier, the reduction of the width of the entrance to 300 ft., and the construction of some embankment walls at various points to increase the velocity of the stream, and at the same time form a scouring basin. Mr. Gile made a survey under the directions of Mr. Rennie, which was completed in 1823, under Sir J. Rennie. This plan is published, and was exhibited. In 1821, Mr. Rennie recommended certain lines of the pier, and the reconstruction of some parts of the works, with sound materials, with other precautionary measures calculated to improve the port, some of which were carried into effect by Mr. Milton. Mr. J. Murray succeeded Mr. Milton, and carried on the designs of Mr. Rennie and Sir J. Rennie, with great solidity, using the diving-bell for part of the foundations. The north pier was thus extended to a total length of 1770 ft. He also removed, in an entire mass, the light-house to the extremity of the intended pier, an account of which has been already submitted to the institution. In 1843, the south pier being in a ruinous state, was partially removed and rebuilt, in a direction better calculated to break the swell of the sea. The plans exhibited the changes that had taken place in the estuary, improving the channel, and, giving, at least, 4 ft. of water over the bar at low water of spring tides. It is narrow and shelving, with deep water on each side. Formerly the large ships took in part of their cargoes beyond the bar, but now they all load within it, even when drawing 15 to 18 ft., and as many as a hundred ships have entered and departed from the harbour in one tide. A longitudinal section of the river showed some remarkable changes in the bed, and corresponding improvements in the heights of the tide, affording, at the same time, increased facility for the drainage of the country around. Dredging has been carried on to a great extent, and from 100,000 to 150,000 tons have been raised annually. The want of floating docks has been much less, and several plans have been projected for them by Messrs. Doidi, Jessop, Stevenson (of Edinburgh), Giles, Brunel, G. Rennie, Walker, and J. Murray, but none have yet been executed. A small dock, of about six acres in extent, was finished in 1838. A south dock, with tide basins, is now in course of construction, under the direction of Mr. R. Stevenson and Mr. Murray, and by its means it is anticipated that Sunderland will become the first port, as to depth of water at its entrance, between the Humber and the Firth of Forth.

May 16.—Sir J. RENNIE (President) in the chair.

The paper read was "An Account of the Sarah Roads, and other Iron Vessels, with directing Auxiliary-engines, and Screw-propellers," by J. Grantham, of Liverpool, Assoc. Inst. C.E. The object of the paper was to show, that a propeller might be constructed of such dimensions that the number of revolutions it would require to make in order to obtain a high velocity would not much exceed that of the ordinary profile wheel, and that hence the usual marine condensing engine might be applied direct to the propeller-shaft, without the intervention of a secondary motion. It appears from the statements in the paper that this opinion was found to be correct, and that Wooller's expanding pitch-screw-propeller was the best form that had hitherto been employed. In a paper read to the institution, upwards of three years since, Mr. Grantham gave his views on this subject, and several vessels had been since built—the results of the trials of which were communicated to the meeting. The principles of those were the *Emerald* and *Diamond*, two-masted steamers, of 300 tons, and 60-horse power; the *Nashville*, of the same dimensions; the *Adelaide*, of 600 tons, and 100-horse power; and the *Sarah Roads*, of 1000 tons, and 180-horse power. Drawings of these vessels were exhibited to the meeting. The capabilities and performances of these vessels were described in the paper, but particular notice was given of the last-named vessel, which had performed a most successful voyage to New York, during bad weather, and adverse winds. The passages made by the ordinary New York liners, which were out at the same time, were very long, averaging 40 days each, and the Boston and Liverpool steamers were much longer than usual on their passage. The *Sarah Roads* used her steam about 17 days, and sailed the remainder, making her voyage in 20 days 10 hours. On her arrival she had about enough fuel remaining for four day's steaming. The paper did not enter minutely into the particulars of the screw itself, as it was considered that too much attention had been given to that branch of the subject to the exclusion of the consideration of the plan for working it, which, after all, had been the stumbling-block to the general adoption of the system. It was necessary with the screw, the theory of which, as a propeller, was so little understood, to proceed with experiments perseveringly in one direction, as variations in the results were frequently attributed to causes which really did not exist. After describing several interesting details, the paper concluded by expressing a desire that engineers should examine the drawings of the system laid before the meeting, and endeavour to add to the stock of information already obtained. After the paper was read, Mr. Grantham added some facts which he had recently gathered, and which strongly confirmed what had been stated. The *Diamond* had recently made a very rapid passage to Madras, deeply laden; but, during the whole passage, the engines maintained a very moderate speed, and quite removed the impression that under such circumstances they would run too fast from their being connected directly to the screw. An account of the last successful voyage outwards of the *Sarah Roads* was also given, and it appeared that, in spite of most severe gales, which had

driven back almost all other vessels, her passage had been made in the most satisfactory manner. In the discussion which followed, several engineers of eminence expressed themselves much pleased with the facts brought forward in the paper, and perfectly concurred with the views put forth. The principle of the following current of the ship, which had a material influence in increasing the efficiency of the screw, was alluded to, and a conviction was expressed that the screw would eventually supersede all other means of propelling vessels on long voyages. An account was given also of the auxiliary screw-steamer that ply between London and Rotterdam, and some interesting facts were given of the power which these vessels possessed of working to windward in bad weather. The subject was closed by a discussion upon several points that had been started, relative to the size of the screw, the mode of disengaging it, and the prospects which were held out on the final success of the principle. The subject will be renewed at the next meeting, on Tuesday, June 1st, when the following paper will be read:—"An Account of the iron barque *Josephine*, of Liverpool," by Captain Masters.

Also, just published, and may be had gratis,

APRIL 28.—WILLIAM HENRY BODKIN, M.P. (Vice-President), in the chair.

Captain William Caldwell was elected a member.

The first communication read was by Mr. Thomas Drayton, "On his Patent Process for Silvering Glass with Pure Silver." [Fully described in another column.]

The second communication read was by Mr. Brett, "On his Electric Printing Telegraph." The apparatus was exhibited. The author commenced by stating, that in July, 1843, he endeavoured to introduce to the Government his printing telegraph, and to urge on them the importance of adopting some such plan as his, in the place of the Semaphore. The great advantages of the electric printing telegraph, either for Government or other purposes, are its great simplicity, certainty of action, and economy. The instrument consists of two parts—one having a row of ivory keys, with the letters of the alphabet, words, or other characters, marked upon them, and is connected with one end of the telegraphic wire, the other end being connected with the printing machine. The printing machine contains a type-wheel, having on its circumference corresponding letters, words, or signs with the key-board, and by means of weight movements and an escapement, a very slight power is sufficient to regulate the whole; so that the instant a key representing any letter, &c., is pressed down, the corresponding letter, &c., is printed, and a bell rung at the other end of the instrument.

Mr. Brett stated, that he considered the advantages of his instrument to consist in its being a permanent register of the communication transmitted—it being printed on paper supplied from a roll of unlimited length, from which any portion of the correspondence may be cut off at pleasure.

The third communication read was by Mr. F. Whishaw, "On the application of Heated Currents to manufacturing and other purposes."—In November, 1844 (says Mr. Whishaw), I read a paper on the manufacture of casks, more particularly those used by brewers, with remarks on the various methods adopted for cleansing and purifying such vessels. The object of the present paper is to show the advantages arising from the application of the same patent (viz., that of currents of heated air) to the following purposes:—1. Seasoning timber generally.—2. Preserving timber.—3. Purifying feathers, blankets, clothing, &c.—4. Drying coffee.—5. Roasting coffee.—6. Japanning leather for table-covers, and other purposes.—7. Drying silks.—8. Drying yarn.—9. Drying distillers' tunns.—10. Drying paper-mache.—and 11. Drying vulcanised India-rubber. The process has also been successfully tested for the following purposes:—12. Drying iron-springs.—13. Drying printed paper, or setting the ink, to enable books to be bound more quickly than usual.—14. Drying starch, and converting it into dextine, or British gum; and also—15. For preserving meat. The paper then proceeded with a very lengthened account of the action of heated air on the various kinds of timber, and the success which had attended its adaptation for that purpose. It was also stated, that 60 suits of clothes, which had belonged to persons who had died of the plague in Syria, had been subjected to the process of purification, at a temperature of about 240°, and afterwards worn by 60 persons, not one of whom ever gave the slightest symptom of being affected by the malady. The author concluded by referring to the mode adopted by the North American Indians for preserving the flesh of the buffalo—viz., that of drying it in the sun; and stated that heated currents had been applied successfully. "How important for shipping?" Instead of sailors consuming salted provision from one month's end to another, to have an occasional supply of fresh meat. It is important also in other respects, as meat treated in this way occupies much less space, and is much lighter in weight. It is believed, that the juices of meat contain about 7-8ths of watery moisture; this the current of heated air removes, leaving the albumen and all the flavour and nutrition behind.

MAY 5.—SIR JOHN BOILEAU, Bart. (Vice-President), in the chair.

George Washington Sheriff, and Philip Le Capelain Esq., were elected members.

The first communication read was by Mr. Deffries, on his new patent (3d) dry gas-meter. [This paper, and subsequent discussion, was fully reported in the *Mining Journal* of the 8th inst.]

The second communication read was by Mr. Boccia, on his improved gas burner. [This was described in the *Mining Journal* of last Saturday.]

The Secretary described an excavating machine by Mr. Pridesaux. The machine consists of a series of scoops, attached to arms fixed on an axle, driven by a steam-engine; as the scoops revolve, they slice off the earth, and discharge it on to an inclined plane, on which it is removed to the wagon. The whole apparatus bears a resemblance to the ordinary dredging machine, and is worked by a steam-engine.

Mr. W. E. NEWTON stated, that an American machine, for a similar purpose, had been used on a railway at Brentwood, and succeeded very well; it cut some millions of tons of earth away in the United States. The greatest difficulty they met with, was getting the wagons up to and away from the machine.

Mr. PAIDEAUX stated, that two wagons could be brought up at one time, and there would be no difficulty in changing them as fast as the machine could fill them.

ON THE PROCESSES OF SILVERING GLASS.

This interesting paper, by Mr. Foozay, was read at one of the recent Monday evening meetings of the Western Scientific Institution, Leicester-square; and, a few weeks since, we inserted a pretty full report of one of equal value, "On the Protection of Buildings, &c., from the Effects of Discharges of Electricity," read at the same institution, by Mr. WILLIAM SMITH. We are pleased at having had an opportunity of publishing papers of so much interest, emanating from its members, as affording gratifying proof of the progress of the society—which, as before noticed, is emerging from a state of decline to one of prosperity and usefulness. Both papers, we may add, were illustrated by several experiments and drawings.]

The discovery of the process of coating glass-surfices with a film of metallic silver in the mirror form (the subject of the present paper) was, most probably, made at the suggestion of some accidental circumstance, and was, as a discovery, perfected in the hands of Mr. Drayton, not by theoretical reasoning, or a strictly inductive method, but by the laborious method of persevering in experiments, such as were by him, from time to time, considered most likely to yield satisfactory results. Nor do the many results thus obtained appear to have been classified or noted, and hence, when first put into the hands of the manufacturer, this discovery was neither more nor less than a perfectly new and beautiful fact, which had yet to be elaborated into a workable process, being surrounded with practical difficulties, and as yet deficient of those mechanical and other auxiliary appliances which convert the experience of the philosopher into the practice of the manufacturer—in fact, this discovery was made in exactly the same manner, and under similar circumstances, with the *Daguerreotype*, and, like that process, could not, in the present state of science, have been discovered by a strictly inductive method, requiring as also, like it, an uncommon description of genius, combined with the greatest perseverance for its development; and the parallel between these two processes holds so far good, that they have both passed through similar progressive steps of improvement, and have both arrived at a state of perfection in practice, while each remains without a theory. More with a view to the gratification of those interested in scientific matters, than with an idea of attracting the public attention to a new fixture in commerce, this process was in a comparatively early stage of its progress towards its present perfect state, brought forward as the subject of a lecture by Dr. Faraday, on one of the Friday evening meetings, at the Royal Institution, at which time it excited that almost universal desire to become practically acquainted with its results, which is the characteristic of what may be called popular discoveries, and which we all feel in the cases of the discoveries of Daguerre, Talbot, Spencer, and Schönbelt; and, from the time when this excitement subsided to the present, the unceasing efforts for its improvement have been gradually rewarded, until all difficulties standing in the way of its practice having been removed, it has at last become a process having many advantages over the old method of silvering mirrors, and which can be carried on at a price commanding an extensive sale. Hence we can make a just comparison of these two processes, it will be necessary to consider them each as at present conducted. By the old method, the reflecting metallic surface is obtained by spreading out upon a perfectly flat table of slate or stone a thin film of a size a little larger than that of the plate to be silvered; and, having rubbed this film perfectly flat, and having cleaned the glass to be silvered with extreme carelessness, the mercury is flooded over the surface of the film; and, before it has had sufficient time to amalgamate very deeply into the substance of the latter, the glass is laid on this a moment, so as to allow the mercury to penetrate the pores of the slate, and any particles of dust which may have collected on its surface, retaining both under surface and under the film a stratum of mercury perfectly free from serum or any other matter which can affect its brilliancy; and, as soon as the glass is thus laid on, weight of cast-iron are placed over its entire surface, so as gradually to squeeze out the surplus of mercury—the object being to leave only the solid amalgam of mercury with the film, in contact with the glass surface; and the more effectually to drain off this mercury, the table is, after a certain time, inclined by a screw mechanism, upon its bearings, and, ultimately, the weights are removed, and the glass is gradually elevated to a vertical position; then the weight is removed before the mercury has been sufficiently well drained off; or if the glass is elevated too quickly, the rapid draining of the mercury is accompanied by the loss of atmospheric air between the glass and the amalgamated film, spoiling the result. As the presence of moisture would be detrimental, the silverer's workshop is kept at a comparatively high temperature. The mercury, which flows away from the glass for the first 10 minutes, is carefully collected, a narrow gutter running round each silvering table, and the mercury thus collected retains in solution a small quantity of tin, which is found to be serviceable, by preventing its too rapid amalgamating action in future operations, which would be liable to dislodge the film into holes, before the glass could be placed upon it. By the process in silvering concave or convex surfaces, it is necessary to make a mould of plaster of Paris, and to rub the film with caution, until it assumes the curve of the surface of the glass to be silvered—in other respects, the method of silvering is the same as the preceding; it must, however, be observed, that if the curvature be deep, the process becomes difficult or quite impossible, and that surfaces of irregular curvature cannot, in any way, be silvered by this process. The process of Drayton is so far different from the preceding, that the only point in which they can be said to resemble each other is, that they produce a result of the same general appearance; and, as far as plain mirrors are concerned, applicable to the same purposes. By Mr. Drayton's process, two solutions are

PROPOSED NEW WROUGHT-IRON BRIDGE AT BRISTOL.



PROPOSED NEW WROUGHT-IRON BRIDGE AT BRISTOL.

RESPECTED FRIEND.—In November last, you did me the favour of inserting in your Journal an engraving and description of my design for a bridge at Clifton, near Bristol—since which, as I conceive, I have made some important improvements, by dispensing with the horizontal bars, so arranging the diagonals as to produce as nearly as possible a complete system of right-angled triangles (which the late Davies Gilbert, Esq., president of the Royal Society, described as the figure of strength), and also improved the mode of junction, by removing the necessity of nuts and bolts. As I stated in my former description, it will be readily seen, that the structure is a compound of the principles of tension and compression—the upper, or road, line being tension, pulling from the rock; the arch line pressing against the rock or abutment, and all the diagonal bars alternately acting in like manner. The improvement in the mode of junction consists in making the ends of the bars of a dovetail form, so as to fit into a strong cast-iron plate, somewhat like the axle-box to a wheel of an oblong, hexagon form, in which is formed dovetail recesses—into which recesses the ends of the bars to be firmly wedged; through the middle is a hole, to receive the transverse bolt, which connects horizontally the several portions of the bridge from side to side; and, in order to secure the ends of the bars in the dovetailed recesses, I propose to affix a strong cast-iron plate, like a large washer, through which the transverse bar, or axle, to pass, firmly uniting them together with keys on both sides, somewhat like the linch-pin of a wheel. This mode of fastening I propose to adopt throughout the whole structure, so as to render bolts and nuts unnecessary; by this means, the whole arrangement will be greatly simplified, and the expense of construction considerably reduced.

I will now proceed to describe the manner of erecting it; I propose to insert in the surface of the rock, at a distance of 80 or 100 ft. from the river side, the required number of strong wrought-iron piles, unitedly sufficient to bear the strain of several thousand tons, and firmly to attach to the heads of these piles the tension or road line, continuing to the edge of the rock, or abutment, under the roadway: I then propose to construct a platform, 60 ft., 80 ft., or 100 ft. long, to run on friction wheels; on the river end of which to construct a series of powerful cranes—the land end of such platform to be loaded, so as to counterbalance the weight of the hanging scaffold, &c.; this hanging platform, or scaffold, to be made 8 ft. or 10 ft. longer than the width of the bridge, and 8 ft. or 10 ft. wider than one of the divisions of the structure (12 ft.), so as to allow ample room for the men to work in, properly fenced round to prevent accidents—the cranes, of course, to project sufficiently to enable the hanging platform, or box, to descend clear of the rock, or abutment, to the depth needful to erect the first portion of the road line, by connecting with the land ties the first portion of the upper line extending from the rock, and then fixing thereto the several vertical and diagonal bars, in manner described: the first portion for the whole breadth of the bridge being complete, the scaffold is lowered down, to attach the bars in like manner, and so on, until the first section of the bridge, with its portion of the arch, is completed; in the meantime, the flooring is laid, on to which the crane-platform, or machine, is propelled: the hanging scaffold is then drawn up, to enable the same process to be continued—and thus, by a simultaneous movement on both sides of the river, the two parts meet in the middle; having so met, I propose strong iron staples on each side of the ends of the road line and ribs of the arch, by which means the two halves may be united by strong iron bolts, or bars, of sufficient length, to allow of contraction and expansion, and thereby remove or prevent the danger which might otherwise happen. Upon a careful examination, I estimate that this structure—say, 630 ft. long, and 50 ft. wide—might be erected for about 20,000£; at all events, I feel very confident that responsible parties might be found willing to complete the iron and wood-work in a handsome and substantial manner, of such substance and materials as to sustain an uniform load equal to double its weight, or 1200 tons, which I estimate would be four times the weight of a loaded railway train of that length, for not exceeding 25,000£.

The following are copies of two letters from the late Dr. Birkbeck:

50, Broad-street, December 29, 1833.

DEAR SIR.—I have great pleasure in expressing the satisfaction which an examination of your projected bridge has afforded. Its effect, when stretching across the view from distant banks of the Avon, will be magnificent; and its security, or stability, from the nature of its bearings and attachments, may be pronounced to be unquestionable. The principle adopted in the construction of this bridge, is accordant with the most solid and substantial qualities of the arch; whilst the series of ties to the abutments institute a new source of strength, without any great addition to the weight of the material employed. I have no doubt, that, if investigated mechanically, your bridge will be found capable of resisting greater pressure—the weight of each being equal—than a chain bridge of the same span, and will be found free from that swing and tremour, which, to the timorous, render the passage along the latter somewhat formidable. There is certainly considerable originality, as well as merit, in the project; and I shall be truly glad to find that the influential individuals, with whom the decision rests, have been induced, by the statements they receive, to make trial of this aerial, yet immovable, structure.

Mr. T. Motley.

I remain, dear Sir, very faithfully yours, G. BIRKBECK.

38, Finsbury-square, December 16, 1834.

DEAR SIR.—Your projected bridge, in its most perfect form, I have again examined with great pleasure, and with increased conviction of its fitness for the singular position which it is intended to occupy; considered in relation to its mechanical principles and its sus-

taining power, the arch, which you propose to construct, is most satisfactory, and will, I am persuaded, combine, in a higher degree than has ever yet been effected, elegance, lightness, stability, and magnitude of span. Nothing can be more conclusive, with respect to its mechanical character, than the convenient and economical fact, that it will be erected securely without centering; and that the approximating halves will not depend, in any material degree, for their own support, or for the support of any load which may be placed upon them, on any resistance at the vertices. Every portion of each half of the bridge becomes, as it is finished, a bent lever; and the whole of each half, consequently, has its power determined, by considering it as a series of such levers, or as one very extended lever, of which the line of abutment is the shortest extremity. It is obvious, however, when the lines of pressure are traced, that in this particular arrangement, traction, to a considerable extent, occurs; and that, therefore, the diagonal braces, occupying the parts of an ordinary bridge, for the purpose of resisting the thrust of the upper portions of the arch, by their weight, alone afford essential support, without loading the arch at all. In this application of the solid sides of the space is to be found, I apprehend, one material principle upon which the extraordinary lightness of your mode of construction depends. The most accurate attention which I have been able to direct to the examination of your intended bridge, has not enabled me to discover any well-grounded objection to it; and, assuming the sufficiency of the abutments, both for thrust and traction, the adequacy, by trial or calculation, of the substance of every part and their junctions, and the excellence of the strong, tenacious, elastic material you propose to employ, the firmness and security of the fabric cannot be disputed. With these views of the essential qualities of the arch, and my admiration of its appearance, as stretching across the valley, at once beautiful and romantic, of the Avon, I cannot but entertain a very ardent wish, that they, upon whom rests the decision, may be induced to adopt it. The structure will, I am persuaded, do honour to the present advanced condition of practical mechanics, and the taste of the influential inhabitants of Clifton and Bristol, and will even prove ornamental to natural scenery, of a description so splendid as to render almost undescribable the ordinary ponderous productions of art; that you may succeed is the belief, of yours, most faithfully,

G. BIRKBECK.

P.S. It has been maintained, that, with an equal weight of iron, your arch is as strong as a chain bridge; it has been asked, what would be the case, if the weight were greater? To this it may be answered, that the strength would, in the same proportion, be greater? Expansion and contraction would, of course, in such a structure as has been proposed, take place to a considerable extent, but without any damage, or even inconvenience, provided the junction of the two halves of the arch were effected with reference to this alteration. Having, during about 20 years, devoted my attention to the construction of bridges with wrought-iron (indeed, I have made it a principal study), I feel assured that I have acquired a pretty accurate knowledge of the proportion, dimensions, and quantity of materials, required to sustain given loads. I, therefore, feel confident in stating, that a metropolitan bridge—say, at Lambeth—might be substantially constructed in five spans, of about 160 ft. each, which, including the piers, would make it about 850 ft. long, with 4 ft. triangles, so as to present an appearance closely resembling the above engraving, 40 ft. wide, of such strength, as to support, with perfect safety, 1 cwt. upon every square foot of surface, complete, exclusive of the approaches, under 50,000£, less than half the cost of the Hungerford Suspension; and a foot bridge, same length, 20 ft. wide, under 35,000£. I should, however, prefer for Lambeth my plan (which I term the arch suspension), which is now being carried into execution over the River Tyne, at Newcastle, for a railway on top, and a road and footway under—particulars of which, I will furnish in your next publication. It may be asked, how it is that wrought-iron bridges are so much cheaper than cast-iron, or suspension? As respects the first I answer, that it requires nearly five times more cast than wrought-iron, to obtain the same degree of security, requiring less expensive abutments, or piers, besides less expensive apparatus—such as centreing scaffolds, &c.; the same remarks apply to suspension, besides saving the towers—so that I estimate the plan proposed will be 50 per cent. cheaper than cast-iron, and at least 25 per cent. cheaper than suspension, and certainly very superior to the latter.

Loudon, 5 mo. 14.

THOMAS MOTLEY, C.E.

PRODUCTS OF COMBUSTION.

Mr. Morrill Wyman, an American chemist, gives the following facts relating to combustion, in a recent treatise on ventilation:

A pint of oil, when burned, produces 1½ pint of water; 1 lb. of gas, more than 2½ lbs. of water.

An Argand burner, in a shop-window, will produce in four hours 2½ pints of water, which may be condensed upon the goods, the window, or any other cold substances.

The Argand burner of the Boston Gas Company, with 22 holes, will produce in four hours, when burning at the rate of 4 ft. per hour, 22 ozs., or 1 pint and 6 ozs. of water, and 4 ft. of carbonic acid, which will render 400 cubic feet of atmospheric air unfit for respiration.

As an illustration of the demand for air to produce efficient lighting, we mention the following:—In the vestry of a meeting-house in Boston, some years since, great complaint was made of the impurity of the oil used; it burned well for a time, when the lamps grew dim, and continued to grow more so through the evening. The sexton was directed to procure better; he tried many kinds, but all to no purpose. He had noticed, however, that the longer he was compelled to remain after the services, and listen to the complaints of the aggrieved, the better his lamps burned, which was soon interpreted to mean the improvement of the air consequent upon the opening of the doors, and the departure of the audience.

STATISTICS OF GAS MAKING.

The official inquiry relative to the supply of gas for Liverpool (before C. E. Ellison, Esq., barrister, and G. Lowe, Esq., civil engineer), has disclosed some interesting particulars. The Old Gas Company are applying for power to raise a further capital of 200,000£, in 2000 shares, at 25£ each, with power to borrow half of the amount stated (100,000£), and a further sum, if required, to effectually carry out the works for the benefit of the town and neighbourhood. The Liverpool Guardian Gas Company, on the other hand, apply for a bill to raise 100,000£, in order to supply gas for the lighting of Liverpool. On behalf of the former company it was proved, that their whole capital, 263,534£, has been expended in the works. Of this, 200,000£ bears interest at 10 per cent.; but it was contended that the present price (4s. 6d. per 1000 ft.) was a loss. The average dividend on the whole capital of 263,534£ was, per share, 7s. 11s. 9d. The charge for each public gas-light, or street lamp, was 4s. 2s. 6d., except the lamps. The coal used in making the gas was exclusively cannel coal, and now cost 15s. a ton, or nearer 15s. 6d. A ton of this produced 9600 cubic feet of gas in an hour's working, and 13 cwt. of coke, which was sold at 16s. a ton. On the other hand, the advocates for the Guardian Gas Company ridiculed the singular anomaly of a company in one breath proving that 4s. 6d. was a ruinous price, and with the next asking for power to raise and spend another 200,000£, in producing gas at this loss. They (the Guardian Company) proposed to sell their gas at 3s. 8d. per 1000 ft. The gas which, it had been said, cost the present company 2s. 9d. at prime cost, could be produced at much less. They could light the public lamps at 3s. 10s. 8d., instead of the price (4s. 2s. 6d.) which was at present charged for the accommodation; and still have 7s. per cent. of a *bond fide* interest, on a *bond fide* capital. To prove the feasibility of the plan, several witnesses were called. Mr. Cox (the engineer) said, the price at which he could light public lamps was 3s. 10s. 6d. per lamp per year. He had taken his data, upon the assumption that 100,000,000 ft. of gas per annum would be sold; if the sale were greater, he would be able to sell at a less price. He would be content to supply the town lamps of Liverpool at *three shillings and eightpence* per 1000 ft., also private consumers at the same price; and he was quite certain that, estimating the public sale at 100,000,000 ft., the return to the proprietors would be 7s. per cent.: if the sale exceeded 100,000,000, the price to the consumer would be reduced. The total cost of the gas delivered to the consumer would be 8s. 2d. per 1000 ft. by the proposed patented process; the cost of production would be *two shillings and threepence* per 1000 ft. He contracted to supply the Great Western Railway Company, at Swindon, *one shilling and eightpence* per 1000 ft., and did not lose by it. He was also the contractor for the supply of gas at Taunton, and his charge of delivery from the gasometer was *one shilling and threepence*.

Now this is no rash speculation—the proprietors of the Guardian Gas Company are men of wealth and respectability; and their engineer, we believe, bears a high reputation. Gas is at present supplied in Liverpool by the old company at 4s. 6d. per 1000 ft., and the Guardian Company offers it at 3s. 8d. What is the price in Preston? It is to the general consumer 6s. 8d. per 1000 ft., with 10 per cent. discount for prompt payment. Previous to the last reduction (compelled, we believe, by public agitation), it was 7s. 6d., with the same discount. Now, we submit that, if gas is now supplied at Liverpool at 4s. 6d. per 1000 ft., and can be supplied, as the Guardian Company deliberately offers, for 3s. 8d., the price of 6s. 8d., or with discount 6s. 2d., ought not to be exacted in Preston. Mr. Reay (of Liverpool) stated before a Parliamentary committee, his deliberate opinion, that the facilities for making cheap gas were not confined to Liverpool, but extended to other Lancashire towns. The best material (said Mr. R.) for making gas is cannel coal, the facilities for obtaining which are very great at Liverpool, and that accounts for the lowness of price, and the superior quantity of the gas. There is an equal facility for procuring the material at Manchester, Preston, and other places in the neighbourhood of Wigan. On this the *Preston Guardian* remarks—“The material, then, is about as cheap here as in Liverpool; labour, we believe, is even cheaper. The consumption, however, is not so great, and the facilities for selling coke are also less than in Liverpool. The consumption upon which the Liverpool Guardian Company calculates is 100,000,000 ft. per annum, and upon this calculation they offer gas at 3s. 8d. The consumption in Preston, we believe, is upwards of 50,000,000 ft., and would, by a reduction in prices, be greatly increased. Making the necessary allowance, therefore, for the advantage of a larger consumption, we maintain that the price of gas in Preston should not exceed 4s. 6d. per 1000 ft., against 3s. 8d. in Liverpool. We are of course speaking now of the price to consumers generally. The few very large consumers, we believe, are more reasonably served by the Preston Company, from motives of policy, inasmuch as such consumers would be driven, by any exorbitant charges, to make their own gas. Smaller consumers, however, are not thus defensively situated, and hence the general injustice and extortion of which we now complain.”

MACHINE FOR MEASURING THE VELOCITY OF THE PISTON AT DIFFERENT PARTS OF THE STROKE.—In the early part of last year we noticed an instrument for the above purpose, laid before the Royal Cornwall Polytechnic Society, at their previous annual meeting. At their last annual meeting, Mr. Bache described an improvement on the one then shown; this consists of a short cylinder working in a frame, and set in motion by a friction-rod from the engine; around the circumference are about 16 small inclined planes, terminating in perpendicular ends; as the cylinder revolves, these planes raise a perpendicular rod attached to a carriage, working up and down in friction rollers; attached to this carriage is a marker, which, as the cylinder revolves, marks with dots a sheet of paper, closer or farther apart as the piston moves slowly or rapidly. The marker is made to move horizontally to form several circles of dots, and the cylinder gives one revolution for every stroke of the piston.

proceedings of public Companies.

MEETINGS DURING THE ENSUING WEEK.

THIS DAY . . . Claridge's Patent Asphalt Company—Paris, at Two.
 TUESDAY . . . Lostwithiel Mining Company—offices, at Two.
 WEDNESDAY . . . Promoter Life Assurance Society—offices, at half-past One.
 NATIONAL BANK OF IRELAND—offices, at Twelve.
 Rock Life Assurance Company—London Tavern, at Twelve.
 Metropolitan Joint-Stock Conveyance Company—Pine Apple Tavern, Hungerford Market, at One.
 THURSDAY . . . Wheal Concord Mining Company—offices, at Two.
 EAST LINCOLNSHIRE RAILWAY—offices, at Two.
 LYONS AND AVIGNON RAILWAY—London Tavern, at Two.
 FRIDAY . . . Waterford, Wexford, Wicklow, and Dublin Railway—offices, at One.
 CROWN LIFE ASSURANCE COMPANY—offices, Twelve for One.

[The meetings of Mining Companies are inserted among the Mining Intelligence.]

THE PROVINCIAL BANK OF IRELAND.

The twenty-second yearly general meeting of proprietors of the Provincial Bank of Ireland was held on Thursday, the 20th of May, at the office of the Bank, 42, Old Broad-street.—OLIVER FARRER, Esq., was called to the chair, on the motion of Sir Moses Montefiore.—The advertisement convening the meeting having been read, the CHAIRMAN proposed the re-election of the four following directors, who went out by annual rotation:—John Alliston, Esq., James Farmer, Esq., John Petty Muspratt, Esq., and Alfred Thorpe, Esq.—The motion was unanimously adopted.

The CHAIRMAN then said that the next duty he had to perform was to call on the secretary to read the report of the directors upon the proceedings of the establishment during the last annual and eventful year. He would enter into no statement until that report should have been laid before them; after that he would be happy to give any information that might be required of him; and he trusted that the report would be satisfactory to the meeting.—The SECRETARY then read the following report:—

REPORT.

In submitting to this meeting the result of the business of the bank for the year ending the 27th of March last, the directors feel it to be necessary to notice the calamitous circumstances resulting from the failure of the potato crop of last year, and the very great distress and suffering that has in consequence existed, and still prevails in Ireland; but while a matter of such importance, affecting every interest in the kingdom, and calculated, immediately, or more remote, to exercise great influence on the welfare of the community, cannot be passed over in silence, the sufferings of the Irish people have occupied so great a share of attention and sympathy in this country, and may be said to have become so painfully familiar to all, that it is not necessary on this occasion to detail the proprietors by attempting to state any details, the leading features of which must be already so well known. In their report to the last yearly general meeting, the directors, in referring to the distress that had existed in Ireland prior to that time, stated that they had felt it to be their duty to contribute on the part of the bank, in aid of the local subscriptions for promoting employment and providing food. Urgent applications for pecuniary assistance in relieving the destitute have since continued from time to time to be received by the directors, with which they have not hesitated to comply. The directors have not, however, made a general subscription to any of these associations through which large amounts have been contributed by the benevolent in this country and elsewhere—it having been considered that, through the instrumentality of the bank's officers in Ireland, and the local committees formed in the districts in which the several branches are situated, the sums voted from the funds of the bank could be more beneficially and economically applied. The directors cannot omit to notice, that the necessity which arose for large importations of grain, at a period when apprehensions of scarcity and a consequent demand for it existed, in order to supply the wants of other European kingdoms, has led to greatly increased prices, which, combined with other causes, has had a material effect upon the money market. To this the directors have, for a considerable time, looked forward; and they have, accordingly, throughout the whole of the past year, exercised the utmost vigilance and caution. The proprietors will readily understand that, in consequence of the comparative cessation of exports from Ireland, and the large imports of food into that country, a great change must necessarily have taken place in the current of commercial and of banking business there; and to this change it has, of course, become requisite, from time to time, to adapt the regulations under which the business of this bank had been previously conducted. This has required and has received the daily and anxious attention of the directors, and it has been their object to afford every reasonable facility to those engaged in commercial and agricultural pursuits; but, at the same time, to keep the operations of the bank within prudent limits; and they are happy to say the results, up to this time, have been satisfactory.

The new branch opened at Carlow, in March, 1846, not having received that support and encouragement which was expected, the directors, towards the end of last year, resolved to withdraw it; and the business has accordingly been wound up, and the branch closed.

The directors have now to call the attention of the proprietors to the statement of accounts which they are enabled to submit to the meeting.

The account submitted to the yearly general meeting in May, 1846, showed

the amount of rest, or undivided profits, at 28th March, 1846, to be £114,923 10 4

From which has been deducted the amount of two half-yearly dividends paid to the proprietors—viz.:

At Midsummer, 1846, 4 per cent. £21,600

At Christmas, 1846, 4 per cent. 21,600—43,200 0 0

Leaving a balance of £71,723 10 4

To which there has since been added the amount of net profits for the year ending on the 27th, being the last Saturday of March, 1847, after deducting property-tax and all expenses, and providing for all bad and doubtful debts.

Making the rest, or amount of undivided profits, at the 27th March, 1847 126,196 12 1

In this state of the bank's affairs, and five years having elapsed since the proprietors had any participation in the reserved profits, which have during that time been gradually accumulating, the directors feel themselves justified in appropriating a portion of the accumulated, and they have, therefore, the satisfaction of announcing it to be their intention to pay in July next a bonus of 12. on each 1000 share, and 8s. on each 10. share, of the capital stock of the bank, in addition to the usual half-yearly dividend of 4 per cent., which will make the sum to be paid 22. on each 1000 share, and 16s. on each 10. share, for the half-year ending at Midsummer next; and the directors purpose also to pay the property-tax for the proprietors, as heretofore.

ROBERT CAMPBELL, Chairman.

The Rev. FRANK HEWSON said he believed—and he was sure it was the belief of every other proprietor—that the management of the bank, during the last eventful year, did the greatest credit to their board of directors, and to the other officers of the establishment. He could state from his personal knowledge of Ireland, and from what he had read in the newspapers, that no company could have exerted itself more for the relief of distress than the Provincial Bank of Ireland had done of late; and it was a most gratifying fact, that after a year of such an awful character, the net profits of the bank should be greater than they had been during the preceding year. He thought they were very much indebted to the present board of directors for their successful efforts to advance the prosperity of the bank; and he was sure that the handsome manner in which they had come forward on that occasion to propose a bonus must meet with the approbation of every proprietor. (Hear, hear.) He wished to take that opportunity of putting a question to the chairman, with respect to the withdrawal of the branch at Carlow. It had been stated last year that the branch at Lurgan had been withdrawn; but, as Lurgan was an insignificant place, that statement could have excited no surprise. Carlow, however, was a prosperous town, surrounded by a rich agricultural district; and, although he felt the utmost confidence in their board of directors, he wished to ask the chairman if he could give any explanation with respect to the withdrawal of the branch of their bank from that town?

The CHAIRMAN said, that the directors had been led to suppose that Carlow required further banking assistance, and they had, therefore, established a branch there; but, as they found by experience, that that assistance was not required, and as it had never been their policy to introduce themselves on a district, of which the wants were already adequately and satisfactorily supplied, they had thought proper to withdraw their Carlow branch. Before that withdrawal had taken place, the branch had been established during the greater part of a year, and its business had, towards the latter end of the period, fallen off rather than increased.

The Rev. Mr. HEWSON said, he thought that explanation was quite satisfactory. He took it for granted, that the Bank of Ireland had ensured to itself the banking business of Carlow, during the period when it possessed a monopoly in all towns so near Dublin; so that there was at present no opening there for another bank. [The chairman intimated that that was the case.] He should not detain the meeting further than to propose, "That the report just read by the secretary be adopted, and circulated among the proprietors."

The motion, having been seconded, was put from the chair, and unanimously agreed to.

The CHAIRMAN said, he could not allow the meeting to separate without addressing to them a very few words. In the first place, he thought he should be acting with great injustice to those officers of the bank, to whom his prosperity lay in a great degree to be attributed, if he did not take that opportunity of expressing his gratitude, and the gratitude, he believed, of all his colleagues, for the zealous and efficient services of those gentlemen. (Hear, hear.) He did not wish, on that occasion, to particularise too many of them, and he would, therefore, only refer to the services of the three principal officers of the establishment—Mr. Murray, Mr. Rawlins, and Mr. Hewson. He had no hesitation in saying, that he did not believe there was an establishment in the kingdom which possessed more admirable officers than those three gentlemen. The exertions of Mr. Murray were almost beyond belief; and the only fault the directors of the bank found with him was, his earnest desire to do with one hand and one pair of hands the duties of several. (Hear, hear.) Mr. Rawlins had been a member of the establishment ever since its formation, and for him every member of the board of directors felt the utmost respect; while his attention to business had been to the proprietors of the highest importance. (Hear, hear.) Of Mr. Hewson, who sat beside him, he could only say, as he was then present, that his business had very greatly increased—that, in inadmissible zeal and industry, he could not be surpassed, and that every day added to the respect entertained for him by the directors. (Hear, hear.) He had also to state that to their local directors and officers in Ireland, in this trying year, they owed much; and that those gentlemen had their most cordial thanks. It could hardly have been expected that, with so many branch establishments as they had, their officers would have escaped the ravages of that fatal disease which prevailed throughout Ireland; and he was sorry to have to state, on that occasion, that Mr. Mackenzie, one of their most useful and respected managers, had lately fallen a sacrifice to fever. That gentleman was a person whom they esteemed; he had been in the service of the bank since the year 1838; he had been for some time an inspector, and, at his own desire, had been again appointed a manager in Waterford, where he had been acting to the entire satisfaction of the directors, and where he had unfortunately lately fallen a victim to the fever which was raging throughout Ireland. He had left a widow and eight children, with the early expectation of a ninth; and he (the chairman) believed he need hardly say, that the directors would consider it their duty to take into their consideration the situation of that family. (Hear, hear.) Leaving that melancholy topic, he would next observe, that it might appear extraordinary that in such a year as the present, the directors should propose that a bonus be given to the proprietors. In the first place, however, he should observe, that there was no year, he believed, in which a bonus would be more acceptable. (Hear, hear, and laughter.) In the next place, he should state, that during the five years during which the proprietors had patiently waited for a bonus, the reserve fund, out of which it was to be paid, had gone on gradually increasing; and, after the bonus was paid, the reserve fund had amounted to about 104,000£, whereas after a bonus had last been paid the reserve fund had amounted to only about 92,000£, or 11,000£ less. He had only further to observe, that it had been their endeavour throughout the year to give every accommodation in Ireland that could be fairly expected from them. He had no hesitation in saying, that the amount of accommodation they had been able to give during the year in Ireland had considerably exceeded that which they had been able to give in other years. At the same time, he was

sure that every gentleman must see that when it became expedient and necessary for an establishment like the Bank of England—the source of all money transactions in the kingdom—to restrict the amount of its accommodation to the public, it behaved all other establishments, which must necessarily be guided by the movements of the Bank of England, to follow, to a certain extent, the cautious policy of that bank. (Hear, hear.) It could, therefore, have hardly been expected, that the managers of the Provincial Bank of Ireland should not have been in some instances forced to place a check on what they considered under speculation. (Hear, hear.) But they had earnestly endeavoured to give, throughout Ireland, every accommodation which they could afford, consistently with a due regard for the interests of the proprietors of the establishment. (Hear, hear.)

DAVID ALLAN, Esq., said, he believed that the exertions of the directors during the year just passed, had exceeded their exertions on any former occasion. He certainly had not calculated that their affairs could have been in so prosperous a condition as the report had just made known to the meeting. The directors had hitherto entitled themselves to the thanks and the confidence of the proprietors; and that had been the case in former years, those thanks and that confidence were peculiarly due to them for their services during the past year. Under these circumstances he felt much pleasure in proposing to the board of directors the cordial thanks of that meeting, for their great attention to the interests of the proprietors of the bank. (Hear, hear.)

The Rev. JOHN LAWES rose to second the motion. He wished to take that opportunity of mentioning a circumstance which had occurred to him in Paris. He had been at Rothschild's—one of the head banking establishments in that city—and on his inquiring

there what was their opinion of the Provincial Bank of Ireland, he had been told that they entertained the highest opinion of the secure and wise manner in which the affairs of that bank were conducted. He felt very happy in seconding the vote of thanks to the board of directors.—The vote was then carried by acclamation.

The CHAIRMAN said, that, in the name of his colleagues and himself, he begged to return the meeting their sincere thanks for that vote. They had been fortunate enough ever since the bank had been established, to meet every year with the kind approbation of the proprietors; and he could assure the meeting, that they would endeavour to continue to deserve that approbation.

The Rev. F. HEWSON proposed a vote of thanks to the local directors of the bank, and Mr. Murray, Mr. Rawlins, and Mr. Hewson, for their zealous and efficient services. He thought it desirable that such a vote should proceed from the general body of proprietors.

CAPT. PORTER, R.N., seconded the motion. He wished to take that opportunity of expressing a hope that any assistance which their directors might think proper to afford to the widow of their deceased manager in Waterford, would be afforded promptly. He could not help adding the expression of his high admiration of the great ability and the sterling honesty with which the affairs of the Provincial Bank of Ireland were managed.

The CHAIRMAN said, he had much pleasure in assuring the hon. and gallant proprietor that his opinion, as to the propriety of the directors at once taking into their best consideration the case of a widow of a deceased manager of their establishment, completely coincided with the views of the directors themselves upon the subject. He felt much pleasure in putting the proposed vote of thanks to the local directors, and to Mr. Murray, Mr. Rawlins, and Mr. Hewson; and he, and every one of the directors, were convinced that they deserved it most richly. The motion was then put, and unanimously agreed to.

The meeting immediately afterward separated.

OXFORD, WORCESTER, AND WOLVERHAMPTON RAILWAY.

A special meeting was held at the office, West Strand, on Tuesday last—F. RUFFORD, Esq., in the chair—at which the draughts of two bills were submitted for approval—to make acts; capital, 600,000£: to make extensions to Dudley and Halesowen, with diverging lines to Stourbridge and King's Clay Works; also, to make deviations and extensions at Wolverhampton; capital, 350,000£.

The CHAIRMAN stated, that the second bill had been thrown out by the committee on the bill, but that the company would petition Parliament to allow them to retain a part of it, only relating to the deviations and extensions at Wolverhampton, requiring a capital of 100,000£.—After some opposition from Mr. Figgins, a resolution was passed approving of the bills.

The CHAIRMAN alluded to the incorrectness of certain statements, made at meetings in Leeds and Liverpool, to the effect that the directors had sold the line to the Great Western Company disadvantageously, made calls unnecessarily, and lent the money to the Great Western Company. He stated, that since the 1st January, 1800, had been expended on the line, that a call of 5s. per share would shortly be made, and that in a few months the line would be opened. He said that he regretted the absence of Mr. K. Lewis, the principal mover at the above meetings; it appeared, however, that no pains had been taken either to inform Mr. Lewis, or the other shareholders, of the present meeting, which was very thinly attended. It was asserted that advertisements of it had been seen in the morning and railway papers, but on the production of the papers alluded to, nothing of the kind was found in them—even a copy of the advertisement could not be produced to read at the meeting. The directors present were, Messrs. Grazebrook, Badger, Mathews, Lewis, Pratt, Barlow, Forster, Beaman, Thorneycroft, and Yappen.

The meeting immediately afterward separated.

MANCHESTER AND SOUTHAMPTON RAILWAY.

A meeting of shareholders was held, on Tuesday last, at Herbert's Hotel, Westminster, to consider what steps should be taken, the bill having been lost on Standing Orders. J. WALKINSHAW, Esq., in the chair.

The report stated that the opposition to the line had been conducted in the name of 14 landowners, representing in all about 25 acres of ground, but had its origin and was paid for by the Great Western Company alone. It stated that the directors had come to a friendly understanding with the South Western Company, by which means about 25 miles of this line will probably be sanctioned this session.

The CHAIRMAN said, that the line was much wanted by the district; that if it depended alone upon its merits, it would have passed through both houses of the Legislature; that they had been urged to proceed with the undertaking by various influential shareholders, from 100 to 1000 shares; and one letter from Glasgow, representing 4260 shares, recommended application for assistance, to some of the great established companies.

MR. STEPHENSON (the engineer) expressed his regret at the unfortunate failure of the bill, which he attributed to a want of unity among those engaged in surveying the line; and feeling himself somewhat responsible for it, as consulting engineer, he had proposed to the directors to forego all charges for the survey, and to place it in the position it ought to have stood in the present session, by carrying it through the Standing Orders next year at his own expense. This announcement was received with loud applause by the meeting.

The report was adopted, and it was unanimously resolved, to proceed with the bill next session, it being understood that those who disengaged might retire, receiving back their proportion of the deposits remaining in hand, which, in answer to questions, the chairman stated might amount to 7s. or 8s. per share. It was also stated that a call, not exceeding 5s. per share, would be required to ensure the passing of the bill next session.

MR. DUFFRYN LLYNVI AND PORTHCAWL RAILWAY.

A special general meeting was held at the White Lion Hotel, Bristol, last Tuesday, for the purpose of adopting, or otherwise, a bill now before Parliament for the amalgamation of the above company, with the Llynvi Valley Railway Company. JOHN HALCOMBE, Esq., having been called to the chair, the proceedings were opened by the SECRETARY (Mr. Bradley), reading the notice calling the meeting.

MR. ROWLAND (solicitor to the company) then read the heads of the bill, which, after enacting that the two companies shall be amalgamated, provides that the property and powers of the company should, after the passing of the Act, be transferred, together with the 40,000£ capital and 10,000£ raised by deposits, to the fund of the Llynvi Valley Company, in addition to their present capital; the amalgamated company, on the passing of the Act, to create 50,000 new stock, in 20s. shares, in lieu of the present capital of the Duffryn Llynvi and Porthcawl Company, the company being guaranteed 5 per cent. interest, with a dividend upon surplus profits.

On the motion of Mr. M. P. SMITH, the resolutions approving of this bill as satisfactorily carrying out the agreement between the two companies, &c., were passed, and thanks having been given to the chairman, the meeting broke up.

LLYNVI VALLEY RAILWAY.

A special meeting of shareholders was held on Wednesday last, at the office, West Strand—Mr. BOWRING, M.P., in the chair—at which the following bills were submitted:—To make an extension line to Newcastle, and amend Act; to consolidate the Duffryn Llynvi and Porthcawl Railway Company, with the Llynvi Valley Railway Company; also to make certain new lines of railway in connexion with the South Wales Railway, and deviations in the line. Resolutions were passed, authorising the seal of the company to be affixed to the deed of arrangement with the Duffryn Llynvi and Porthcawl Railway Company, and approving the bills, with the exception of that referring to the South Wales Company, and approving the bills, with the exception of that referring to the South Wales Company, and approving the bills, with the exception of that referring to the South Wales Company.

MR. BORDEAUX AND CETTE RAILWAY.

A public meeting of the company was held, on Monday last, at the London Tavern, pursuant to a requisition from the shareholders, to consider the propriety of taking the necessary steps, in conjunction with the shareholders in France, for dissolving the company, and returning the deposits.

DAVID SALOMON, Esq., in the chair.

The CHAIRMAN read the requisition, and stated that the directors had felt it their duty to call the meeting, in order that the shareholders might have an opportunity of declaring their sentiments.—MR. ATTWOOD then read a document of some length, the object of which was to point out the disadvantages that would attend the speculation, if continued under present circumstances.—MR. WILKINSON stated that the opinion of several eminent counsel of this country had been taken on the subject; and it was their opinion that circumstances arose in this company which would enable its dissolution to be strictly legal. There were only two courses open to the shareholders—the one was a change in the terms of the concession, the other a dissolution of the company. He dare say every one would agree with him, that under present circumstances no change in the concession would induce them to go on with the undertaking. (Hear.) French counsel had stated that circumstances arose in this company which impressed on the contract what they called, in French law, *un force majeure*, equivalent to the *casus major* of our civil law, which was an uncontrollable necessity that precluded the contracting party from completing his engagement; in which case his object was to cancel the contract, and free the party from liability to damage. English counsel had stated the same—so that in his opinion there was no doubt of their power of recovering back their caution money. Another thing in their favour was, that the French Government had been deceived in the report, upon which they had formed their estimates. Taking all circumstances into consideration, he had no doubt but the French Government, on a proper representation of all the facts from a committee of the English and French shareholders, would agree to return the deposit money, and above all, from their contract altogether. In conclusion, he had read several resolutions, which had been prepared for this meeting. The first was to the effect, that from circumstances over which the shareholders had no control, it was expedient to wind up the affairs of the company; the second, that a committee be appointed to endeavour to obtain from the French Government, the return of the caution money, and that the expenses attending this do not exceed 6d. per share.

MR. USIELLI proposed the first resolution—he admitted that he advocated going on with the company some time ago, but, circumstance, he now confessed, had caused him to change his opinion. He had not the least fear that the French Government would feel the caution money, such an Act was quite unknown in France. Suppose they were successful in getting back the caution money of 17. 11s. 6d., they would also have the remainder of the deposit—viz.: 2s. 6d., in the hands of the directors—making 4s. per share less the expenses of the company.—The Hon. B. BROWNE seconded the motion.

THE CHAIRMAN said, the directors had considered this strictly a commercial business; he felt, however, bound to say, that it

SHARE MORTGAGES—IMPORTANT QUESTION.

A case, involving a point of considerable interest, and one never before mooted, came before the Vice-Warden, in the Court of Stannaries, Cornwall, during the present sittings in Equity. The cause was "Symons v. Davy." Mr. Chilcott appearing for the plaintiff, and Mr. S. Peter for the defendant. There were no witnesses called on either side, the whole case being made to rest upon the allegations in plaintiff's petition, and certain admissions in defendant's answer. The petition stated that a mine, called Wheal Trelawney, in the parish of Menheniot, was carried on in 130 shares, and that one of these shares, which belonged to the plaintiff, was held by the defendant as security for money advanced to him. The petition further stated, that on the 6th of February, 1845, the transfer of the share being an absolute one, a memorandum was given by defendant to plaintiff in the following words:—"Mr. John Symons.—You having this day transferred to me 30th share in Wheal Trelawney Mine, in the parish of Menheniot, Cornwall, and it appearing upon the face of the transfer to be an absolute and unconditional transfer, I do hereby acknowledge that I hold the same as a security for 40L now due from you to me, together with interest at the rate of 5 per cent. per annum. And I undertake to transfer the said share to you at any time within six calendar months from the date, upon receiving the said sum of 40L and interest, and such further sum as may be owing from you to me at the time of your applying for such retransfer. If at the expiration of six calendar months from this date, your debt to me not paid, I shall exercise such rights of ownership over the said share as may belong to me under the said transfer, bearing even date herewith." The transfer of the share to the defendant was duly entered in his name in the cost-book of the mine. The money was not paid by the plaintiff at the expiration of six months, and about a month after that time defendant sold the share without any previous notice to the plaintiff of his intention. The petition then alleged several conversations between plaintiff and defendant, which the answer, for the most part, denied. It then alleged that in the month of February, 1846, a dividend amounting to 8L per share was declared, and that at the meeting when it was declared a notice was given by plaintiff to the purser of the mine not to pay any dividend to the defendant. Then in February, 1846, the solicitor for the plaintiff applied to defendant for a retransfer of the share, at the same time offering to pay whatever might be due on the security; but defendant, through his solicitor, refused to give a retransfer. The petition then charged that defendant was not authorized to sell the share without the consent of plaintiff; and that he was now liable, in equity, to account for the purchase money at the highest price, or to replace the share, at the option of the plaintiff. The petition then prayed for an account, and that defendant might be charged with the highest price at which a share might have been sold, or with the present highest price, at the option of the plaintiff. In addition to the above facts, the answer admitted a subsequent supply of goods and loan of money by defendant to plaintiff on the security of the share, and also some payments of account. The answer further admitted, that defendant had sold the share for 185L, which was then the *bond fide* market value; that since the share had been sold the price of shares in the mine had risen to 330L; and that the value at the time of filling the answer was 260L.

Mr. CHILCOTT then proceeded to argue, that from the terms of the memorandum given by defendant to plaintiff on the 6th of February, 1845, and from the admitted fact that defendant continued to supply plaintiff with goods and money on the security of the share, it was evident that defendant held the share of plaintiff as a mortgage. It was also clear that defendant had sold the share without giving the plaintiff notice, and without his consent; for, although several conversations with plaintiff were denied in the answer, it was yet admitted by the defendant, that in February last he alleged to plaintiff that he was justified in selling the share; that he had done it for the best, as the price was high at the time; and that he thought plaintiff would be well pleased with what had been done. It was quite clear, Mr. Chilcott said, that defendant given a previous notice to plaintiff, he would then have so stated, but instead of that he said, "I did what I thought to have been the best, and I thought you would be well pleased that I did so." He (Mr. Chilcott) contended that defendant ought to have given notice to plaintiff of his intention to sell the share. He next proceeded to argue, that assuming the share in question to have been held by defendant as a mortgage, it was a mortgage without a power of sale. He cited cases to show that a fixing a time for payment of money lent on a mortgage by no means turns the mortgage into an absolute conveyance after the time of payment is expired—the doctrine being that "once a mortgage always a mortgage." And if defendant had no power of sale, there was no subsequent acquisition on the part of plaintiff to justify the sale, that aequivalence being only for two or three months; for in Feb., 1846, plaintiff gave notice to the purser of the mine not to pay a dividend to the defendant.

The VICE-WARDEN observed, that the question was, whether plaintiff had a right to give that notice, or, if he gave it, whether the purser could take account of any equitable interest in shares. It certainly was not the present custom of purasers or of adventurers to do so, and they would involve themselves in considerable difficulty if they took such notice. They acted as the Bank of England, which acknowledged the legal holder of stock alone, and him they paid. He had never yet seen any equitable interest acknowledged in a purser's book, and it would be very detrimental to the mining interest if they acknowledged such interest, instead of the legal holder of shares.—Mr. CHILCOTT said, that this question only arose on the supposition that defendant had a power of sale, which, he contended, defendant had not. Then the real difficulty of the case with respect to this power of sale turned on the construction of the words "right of ownership." The defense read thus:—"If at the expiration of six calendar months from this date, your debt to me not paid, I shall exercise such rights of ownership over the said share as may belong to me under the said transfer." Those words, he submitted, gave no power of sale, but merely a right to attend meetings of the adventurers, and, perhaps, to receive dividends upon the share, and apply them towards the debt. That power, he contended, was sufficient to satisfy the words "rights of ownership," in the sense in which those rights were applicable by a mortgage. The words "rights of ownership" being thus explained, there was nothing left to show defendant's power to sell the share; and if so, the next question was, to what remedies was plaintiff entitled. There were no cases of mortgage of mine shares that could be cited, but the cases most analogous were those of fraudulent sales by trustees of trust property; and in those instances the trustees had been obliged to replace the stock, or to pay the purchase money to the plaintiff at his option, the stock, in some cases, when it had to be replaced, being at a price considerably higher than when it was sold.

The VICE-WARDEN observed, with regard to replacing a share, that that remedy was not so applicable to mining property as to stock, in which purchases were always to be effected. He could not decree that a share in a mine should be replaced, unless he knew that defendant had shares, at the time of the decree, standing in his own name; for it would be a hardship, when he was unable to execute the order, thus to place him in a position of contempt.—Mr. CHILCOTT said, that it was a strong argument for him, that if plaintiff could not have the share replaced, he was entitled to the highest price which the share would have fetched since it had been sold—which was 330L.—In answer to the Vice-Warden, Mr. STOKES said, the present price was 200L.—Mr. CHILCOTT then concluded his argument by citing cases of *cessum que trust*, upon which he contended, that the plaintiff in the present case was entitled to the option of those remedies prayed for in the petition.

Mr. STOKES, on the part of defendant, said, that his client had always been prepared to render an account of monies he had received; and he was now prepared to take an account before the registrar of all transactions between himself and the plaintiff, to pay plaintiff the balance if anything was due, or to receive from him the balance if anything was owing. But he (Mr. Stokes) submitted that plaintiff was not entitled to the relief he sought by his petition. He then contended that it could not be deduced from defendant's answer (as Mr. Chilcott had inferred), that the sale had taken place without notice. But if defendant had sold without notice, it was well known that in ordinary mortgages on land a period for payment of a debt is inserted, and if not paid at the time, the equity of redemption continues; but, if a power of sale is inserted, and there is no notice required in the proviso, the mortgagee, after the time named for payment is expired, may sell without giving any notice to the mortgagor. He next contended that defendant had a power of sale, and this without reference to the expressions of the defences—his right to sell resting upon the peculiar nature of a mine transfer. He then cited a case to show that Exchequer notes might be sold under a mortgage, without a foreclosure, and also other cases, from which the principle was deduced that securities of a mercantile character are not to be treated as securities upon real property; for being of a fluctuating nature, it was reasonable that parties taking those securities should have the power of immediate sale in default of payment. The cases which he cited, however, were those in which notice of sale had been given by the mortgagor, but this fact, he submitted, was not considered essential in their decision. Then if in regard to mercantile property, or to insurance and stock, a power of sale was held to be applicable, how much more should this be the case in the treatment of property of such a speculative character as mine shares? For, supposing the defendant had been obliged to apply to his Honour for a decree of foreclosure, before that would be obtained the share might have sunk in value considerably, and defendant's name being on the cost-book as an absolute transfer, he might, during that time, have been subjected to heavy costs. That was the reason why, with the act of transfer, defendant should have a power to sell whenever it was expedient to sell. Then with regard to the expressions of the defences, he submitted that the words "rights of ownership" meant not such as his friend had stated, as being the rights of a mortgagee, but they conveyed a right to transfer the share without any equity of redemption. If it were regarded as a mortgage security, the power of redemption could only be in the event of the party who borrowed applying within six months to pay off the debt; otherwise, there being no condition expressed in the transfer, the defendant might exercise the rights of ownership of an unconditional transferee, which was a power of sale. After again citing cases with the view of showing that defendant was not bound to give notice of sale, Mr. Stokes said, it was the mortgagor's place to have paid off the debt and demand a retransfer within six months, but he did not make this demand until February, 1846, when the mine became profitable, and a dividend was declared; and he (Mr. Stokes) submitted that these *laches* should also tell against the plaintiff.—Mr. CHILCOTT then addressed the court in reply: after which the VICE-WARDEN said, he would take time to consider the case.—On the following day, the VICE-WARDEN said he could not give his judgment in less than a fortnight, as this was a case that required considerable attention. He would send his judgment through the secretary.

MINERS' QUADRANT.—The practical miner has always been subjected to considerable inconvenience in using any of the common quadrants attached to the miners' dial, for finding the angle of elevation or depression so often necessary in his underground operations. Intricate and dangerous places have to be surveyed, and it is not at all uncommon to erect stages, temporary floors, or a few loose and shaky boards, on which to fix the dial for such surveys. After the dial, with its quadrant, has thus been fixed (and often very unsteadily), the only object to be effected is to measure the angle by the assistance of a pair of common sights attached to the instrument, which perhaps gives at the same time the length of the base (underlie) and perpendicular to every fathom of the line so surveyed. After this, the measuring line or chain must always be subtended over the part, and the number of fathoms, feet, and inches found. It is to remedy the inconvenience, and remove the dangers and difficulties of such unsatisfactory operations, that the present instrument has been constructed. It is not offered as a substitute for a more elaborate quadrant in surveying situations easily accessible; but is presented to the practical miner because it supersedes a desideratum in which all other instruments are deficient. **Description:**

The instrument consists of a semicircle of brass with three distinct series of graduations on it, the outer series gives the angle to 30°, the middle ditto the base, or underlie, and the other the perpendicular to every fathom of the slant line. To use the instrument it is only necessary to stretch the measuring chain through the shaft, winze, sink, or other part of the mine to be surveyed, and then to hang the quadrant to a link of the chain—the plumb line will cut the respective divisions in each series required. If any doubt exists as to the correctness of the graduations, the instrument may be inverted on the chain, and then the plumb line will cut the division on the opposite side of the limb—a mean between the two results will give the truth. By a simple contrivance the instrument is made to snap on easily to a link of the chain.—Mr. WILTON: Royal Cornwall Polytechnic Society.

THE LIGHT OF THE SUN.—Dr. Wollaston calculates that it would take 5563 candles, placed at the distance of 12 in., to give a light equal to that of the sun.

MINING ADVENTURERS' SUBSCRIPTION ROOM,
AND ORIGINAL REGISTER OFFICE FOR THE SALE AND PURCHASE OF MINING SHARES.

TO THE EDITOR OF THE MINING JOURNAL.

SIR.—The *Morning Post*, a short time since, under the head of "Money Market and City News," considered it expedient to remark upon an apparent spirit of exclusiveness in favour of the Cornish and Devonshire mines, to the neglect of those existing in other parts of the British empire, which was considered had been manifested by the Editor of the *Mining Journal*, and followed and exhibited in the prospectus published by us in your Journal, for the purpose of establishing a better market for mining property than had hitherto existed in London. The remark to which we allude, having reference both to your paper and to our prospectus, thus:—

"In the same spirit of limited encouragement and support of native industry, Messrs. Crossman, Sommers, and Co., of Threadneedle-street, have issued a circular, or prospectus, but confining the benefit and advantages which such an establishment would confer, it would seem, to matters connected with Cornwall and Devon. The want of an office of this nature, as a place of rendezvous in the metropolis for parties connected with mining operations generally, has been long felt, and it might be believed, therefore, that there must have been some mistake or oversight in the preparation of the prospectus alluded to. The words employed do not, in all probability, accurately and fairly convey the wishes and intentions of the parties named, who seem to be promoters of the project; for the character of Messrs. Crossman, Sommers, and Co., as an individual firm, is said to be that of men of straightforward and extended, rather than narrow, views. The cursory reference here made to the subject may, perhaps, lead to a revision of the scheme, as laid down, and to an extension of the utility of the proposed establishment far beyond the confines of Cornwall and Devon; its success otherwise may be greatly questioned. The advantages of an association of this description are not by any means overrated in the circular; for it is well known that the Stock Exchange sets its face against the introduction of miners' ready transit business in foreign speculative, or what they term 'sporting,' concerns."

Upon reading this paragraph, we were exceedingly anxious to remove such erroneous impression, as far as it concerned ourselves; we, therefore, addressed the following letter to the Editor of the *Morning Post*, which he was pleased to insert under the same head of City Intelligence:—

"SIR.—In your paper of Thursday last, under the head of 'Money Market and City News,' you were pleased, with much good feeling and justice, to remark upon a prospectus published by us, wherein we announced our intention of establishing a 'Mining Adventurers' Subscription Room,' and wherein we proposed a system for the sale of mining shares, which we considered would tend to remedy the evils attached to the present system of share jobbing, of which the legitimate mining adventurer has so long and so justly complained."

"We beg, in reply to your observations upon the *apparent exclusiveness* of our intended operations, to assure you, we by no means wished it to be understood that our extensions should be limited to the sale of shares in mines situated in the counties of Cornwall and Devon. Our attention to the necessity of an office for the registry of shares, was first drawn by parties largely interested in mining operations in these counties, and under their advice our intended mode of business was systematised; but it is our desire and intention to devote ourselves generally and fully to the mining interests of the United Kingdom and our colonies."

"The necessity for the establishment of an office such as our prospectus proposes, arises in the evils attendant upon the former system, which have been fully explained to us. From our own experience we do not presume to state that we are cognisant of such evils; nor do we desire to seek success by making any sweeping charges of mal-practice against a body of men in opposition to whose mode of business it may appear we stand, by offering ourselves as the instruments in carrying out a better system. It is sufficient for us, that mining adventurers themselves desire the existence of the evil, and propose a remedy, by the introduction of a system of equity and mutual protection, which, we are informed, has been long and ardently called for by mining adventurers; which, we are informed, has been earnestly proposed to the former shareholders for their adoption, but obstinately refused, and which, we are happy to find, has (except only the erroneously supposed exclusiveness) merited your approbation."

"You will please observe, by our prospectus, that we have commenced our operations on a small scale; but we shall be happy, if favoured with the support and advice of mining adventurers generally, to reconsider and revise our system, and to remodel and extend our establishment, until it shall be found to comprehend the best and most complete market for mining property and shares which can be devised and established."

"We invite attention to our system, as now proposed, and also the favour of any remarks which would tend to improve or perfect such arrangements. The members of our house do not pretend to an extensive knowledge in mining operations or in mining property. We are assured that, whilst acting strictly as agents, and selling on commission, such knowledge is not essential. We pledge ourselves to abstain from all dealing in mines, or in mine shares; we abstain from offering any *private* information, whereby to augment or depress the value of any property submitted for sale—being well assured that *prettended private information* has often been unfairly used; we conduct our sales upon authenticated documents and reports, derived from the best and most accredited sources; we shall quote real prices as obtained, but such are the result of *bond fide* transactions; and these principles combined with a comprehensive system of registry of all shares offered for sale, and shares in demand, will, we trust, be found to afford to the mining adventurer the publicity which every property must obtain before it can reasonably be supposed to be in a marketable position."

"Since issuing our prospectus, several correspondents have signified their approval, and expressed their readiness to be appointed agents in the different mining districts. We beg to assure you, we are desirous of taking an *extended* rather than a *narrow view* of these matters; and we, therefore, beg you will permit us, through the medium of your paper, to say that we conceive such *exclusiveness* unnecessary, and that we shall be happy to co-operate with any accredited parties, who will publicly announce their intention of conducting their business upon the principle defined in our prospectus, and who will strictly adhere thereto."

"We are highly gratified in observing the interest taken by you in mining matters; and if, upon reconsidering our prospectus, with this our explanation, it will be your opinion that our establishment will be beneficial to legitimate mining adventure, we shall be happy to receive such support as you can justly and consistently give."

"Mining Adventurers' Subscription Room," "CROSSMAN, SOMMERS, & CO.

28, Threadneedle-street, London."

It being our earnest desire to establish a system whereby mining property will be fairly represented and dealt in, and to induce other brokers or agents to co-operate in a system which is gaining ground in public estimation, and which, from the protection afforded by a perfect registry of shares for sale or purchase, must eventually supersede the former most unsatisfactory system of jobbing under the cloak of agency and commission; and it being our desire that such system should extend to mines or mining property generally, we are inclined to hope you will (whilst you disabuse the public of the impression of your own partiality) be pleased to introduce in your valuable paper the correspondence upon this point between ourselves and the *Mining Post*.

28, Threadneedle-street, May 19. CROSSMAN, SOMMERS, & CO.

ACCIDENTS.

Dreadful Colliery Explosion near Leeds—Nine Lives Lost.—On Monday morning an explosion of fire-damp took place at a colliery at New-hall, Beeston, about two miles from Leeds, belonging to Messrs. Harding and Co. The explosion was of a very terrific character, and resulted in the deaths of seven human beings, the serious injury of an eighth, and the destruction of much of the property used in the working of the mine. It appears that the colliers, in the course of their labours, broke into an old pit, from which the confined and inflammable gas issued, and, coming in contact with the lights used in the pit, caused an almost instantaneous explosion. Six of the unfortunate persons who were at work in the pit were killed on the spot, and four others were got out alive, and conveyed to the Leeds Infirmary, where three of them expired. The names and ages of the deceased are—Joseph Longstaff, aged 55 years; Aaron Bell, 20; George Bell, 16; George Oddy, 29; William Westerman, 12; Charles Duck, 14; and John Hall, 10.

Messrs. Harper and Moore's Ley Waste Clay-pit, Kingswinford.—W. Aston shafted the shaft, about 105 ft. deep, to commence work; on getting to the bottom, he had gone to fetch a candle from one of the workings, and had again to pass the bottom of the shaft on his return; Joseph Davis, who was employed in hanging on the skips, cautioned him not to cross the shaft as a full skip was ascending, and some of the materials might fall from it. The deceased replied, that he would leap across, and had just made the leap, when a piece of clay, weighing about a quarter of a hundred weight, fell from the skip, struck him on the head, and instantly deprived him of life.

West Bromwich—Dreadful Death of a Man in a Coal-pit.—On Wednesday last, a fatal accident, attended with shocking circumstances, occurred to W. Jones, 40 years of age, residing in Swan Village. Along with some other comrades, he was working in a pit belonging to Messrs. Salter and Raybould, of the Heath, Lewisham, and Victoria Collieries, and was engaged at a part of the pit which appears to have been recently opened, but had been properly secured in the usual way, and was considered quite safe until the occurrence of the accident by which the poor man lost his life. The deceased was about to "undergo" some coal, when those working beside him heard a movement over their heads, which warned them of impending danger, and gave them the opportunity to run out of the way, but the unfortunate deceased was caught by the falling of a quantity of coals and stones, which dashed him to the ground. On those in the pit going to his assistance, they found him quite dead, and the cause of death sufficiently obvious, for his chest had been burst by the falling mass, and his heart forced out and propelled to some distance!

Collington Mines.—A miner, named Pearce, was greatly injured by the explosion of a hole.

Clay Cross Colliery.—J. Marshall having prepared a blast, retired to a distance, but it suddenly exploded, and killed him on the spot.

Plessey Stone Quarry, near Nottingham.—G. Blore and T. Bingham were killed here by a fall of rock.

Mason Lead Mine, Matlock.—H. Henstock and H. Henstock, jun., were killed here by a fall of earth.

Lockford Colliery, near Chesterfield.—A quantity of "tubbing," with which the shaft was lined at this colliery, unfortunately gave way, and an immense body of water rushed down the shaft, inundating the mine, when near 90 men and boys were in it; all were rescued, however, except a man named D. Barnes, whose body had not been found.

Lings Pits, near Clay Cross.—Owing to the carelessness of the workmen, the loaded carriages were allowed to run down the incline, without the rope being attached for drawing up the empty waggon; the consequence was, that they dashed down with tremendous violence, tearing up the rails, and eventually running into 24 carriages belonging to the Wingerworth Colliery Company, doing 1000L worth of damage.

The Miners' Manual, and Shareholders' Guide.

BY J. Y. WATSON, ESQ., F.G.S.

KIRKCUDBRIGHTSHIRE MINING COMPANY.—This company was formed about four years since by some London and Cornish gentlemen, to work the mines of Cally, on the estate of the late Alexander Murray, Esq., M.P., of Broughton. Previous to the formation of the company, Cally had been worked on a copper lode, and ore returned to the value of 416L 10s. 1d.; it was not, however, found to hold below the adit, and the mine about two years since was abandoned with a loss. The agent of the company in Scotland (Capt. Buzzo) then obtained a grant in a lead district, and discovered the promising mine now worked by the company, and called CAIRNSMORE. The sett is in extent about two miles north and south, and two miles east and west, and held on lease for 21 years from 1847, at 1-14d. dues, the lord, or owner of the soil, being James Stewart, Esq., of Cairnsmore House; held in 807 shares; 5L 15s. per share paid up; market value, 12L; conducted on the Cost-book System; secretary and purser in London, Mr. Thomas Hacket, 26, Birch-lane; manager at the mines, Capt. Joseph Buzzo. Operations were commenced at Cairnsmore about a year and a half ago, by sinking a shaft on the course of a lode Capt. Buzzo had discovered by co-staining. In this shaft lead was found 8 fms. from the surface, and at the period of our visit in September last, it was down to the 20 fms. level, and about 15 tons of lead ore broken; the shaft is now 40 fms. deep, and 87 tons of ore have been sold, yielding 826L 9s. 5d., and 30 tons more shipped for sale—since sold for 270L; the present returns are from 30 to 35 tons per month, at an average price of about 9L per ton, which rather more than meets the working cost; there are, however, considerable reserves of ore (calculated by Capt. Buzzo at 810 fms., and worth 4100L, without taking the 40 fms. level in the account); and, as the works extend, the shareholders may reasonably look forward to handsome profits; within the last month a caunter lode has been found in the sett, yielding 1 ton of ore per fm. The mine is worked by a water-wheel, calculated to take her down 60 fms., and the water-power brought to the mine by a leat, nearly 200 fms. long, will be sufficient for another wheel when required; railroads and other efficient works have been completed within the last few months. Owing to the extensive buildings, water-wheel, the houses, tramroad, &c., involving a considerable outlay in timber, iron, &c., the costs have been heavy of late; but, considering the short time since the lode was discovered, Cairnsmore offers a fine example of

Mining Correspondence.

ENGLISH MINES.

ALBERT ADVENTURE.—I have twice inspected this mine since taking office as agent. I have found the work at grass, as also the shaft, adit, and cross-cuts, in proper condition for the requisite mining operations. The four men driving the cross-cut, to discover the lode in the south part of the sett, having met with a channel of elvan, are now driving east thereof, and will probably find the said lode in about five weeks; the ground is favourable. The staff at grass from the lead vein, in the north cross-cut, I think well; I judge the lead to be valuable for the silver it contains. The four men working in the said vein have found the south wall, and I have directed them to drive north, to discover the north wall—this is a large and promising lode. I consider the north lode to be a very kindly one; and I find there is a lode further north, which is well reported of, and which I hope shortly to make some discovery on. It will be also desirable to open on the Quarry lode in the extreme south of the sett, and which I think may prove a valuable acquisition to the concern. I also find there is a large cross-course, at about 50 fms. east of the present workings, intersecting all the lodes; and I have an opinion, that in its immediate neighbourhood, the lodes may be considerably enhanced in value. On the whole, I strongly recommend the immediate prosecution of the necessary work, to make an efficient trial of this promising piece of ground.—R. KENDALL.

BARRISTOWN.—The lode in the 18 fm. level end west is without alteration, as far as we have taken it down, it is worth from 182 to 207 per fm.; the rise behind this end is also worth 182 per fm. The 12 fm. end west is worth about 122 per fm. The stopes from this, to the 18 fm. level, perpendicular, are looking well, worth 182 per fm. In the winze, sinking under the 18 fm. level, the lode is still poor. The men at Clon Mines are still employed in cutting the drift across the hill at right angles with the run of our lodes. We have engaged the *Ocean Queen* to take a cargo of lead to the ticketing at Holywell, which will be shipped about the 20th.—T. ANGOVE; G. WHITE: May 15.

BEDFORD UNITED.—At Wheal Marquis, we have resumed sinking the sump winze in the 80 fm. level east, in which the lode is 3 ft. wide, and worth 202 per fm.; in the 80 fm. level east, we are driving by the side of the lode. There has been no lode taken down in the 70 and 58 fm. levels east. At Liscombe there is no important alteration in the rise or adit level. The lode in the south engine-shaft is 3 ft. wide, spar, mundic, and ore—good saving work. In the adit level east, the lode is 18 in. wide, producing good stones of ore.—J. PHILLIPS: May 18.

CALLINGTON.—In sinking the shaft at Kellybray, we find the ground of a favourable and congenial character for the production of copper, with numbers of small branches dropping into the lode, composed of quartz and mundic, with chlorite, and spots of copper ore. The water is very quick, principally coming out about 9 or 10 fms. from surface; had the shallow adit been driven in, most of the water could be taken up. We have also made an attempt to sink the shaft on the course of the lode, and find the water so quick, that we cannot proceed. Last summer we had not one drop of water whilst sinking here, previous to the rains setting in, and are now anxiously looking forward for dry and settled weather. At the north mine, the lode in the 100 fm. level north is 10 in. wide, composed of fluor-spar and silver lead ores; we are rising in the back of this level, and find the lode small, producing silver-lead ores; in the south end we are opening ground, that will work at a moderate tribute. In the 90 fm. level south the lode is 18 in. wide, composed of white iron, intermixed with silver-lead ores. In the 80 fm. level south the lode is producing silver-lead ores. In the 70 fm. level east, on the copper lode, we find the ground favourable for driving. In the 40 fm. level, to the east of the cross-course, we have commenced driving south in search of Kellybray lode, carrying a small branch of the cross-course, where we have a quantity of mundic and decomposed felspar—the ground is soft; in the north end, in this level, we have the channel of elvans—the character of the same is similar to the one we have in the south mine, where such rich deposits of ores have been met with—here the lode is unproductive. At the south mine, the lode in the 125 fm. level south is rather disordered, producing good stones of silver-lead ores; the north end is driving through ground that will work at a moderate tribute. In the 112 fm. level south the lode is 18 in. wide, producing silver-lead ores; we are sinking a winze in the bottom of this level, to communicate with the 125 fm. level; the lode is not taken down. In the 100 fm. level south the lode is split in branches; the back of the north end will set at a moderate tribute. In the 90 fm. level south the lode continues productive—opening tribute ground; we have just begun to sink a winze behind this end, which will open some very good tribute ground, and being hard will continue for some time; in the north end the lode has not been taken down. In the 80 fm. level north we are opening tribute ground. We expect to sample this week above 100 tons of silver-lead ores, and have about 4 cwt. of tin ready for sale.—J. T. PHILLIPS: May 17.

CUBERT SILVER-LEAD.—The sumpmen are now ready to commence sinking again the engine-shaft. In the 35 fm. level, the lode going east and west is from 2 to 3 ft. wide, exceedingly wet, and composed of spar, with a good deal of mundic, and some lead—it may be said a very promising lode, although at present not rich; being doubtful, however, that the Trebiskin lode is not yet cut, we have again resumed the cross-cut to drive further north. In the 25 fm. level, going west, the lode is 1 ft. wide, and tolerably good saving work; driving east, in this level, the lode is 2 ft. wide, composed of lead, spar, and mundic, nearly the whole is saved for work—we consider it to be a very promising end. The 15 fm. level is at this time unproductive. The tributaries are all working regularly, and most of them (we hope) are earning fair wages.—RICHARD ROWE.

DEAN PRIOR AND BUCKFASTLEIGH.—We have this day holed the winze from the 40 to the 50 fm. level; the levels being ventilated will enable us to make a greater progress by increasing the number of men—that is, to put six men in each of the ends, in order to drive west to prove the lode under the hill with all possible dispatch, being so desirable an object, having such extension of virgin ground before us. In the 30 fm. level the south part of the lode is about 12 in. big, composed of spar and mundic. In the 40 we are driving by the side of the lode, under present circumstances, being the most economical plan, the ground being favourable for driving. Capt. Richards being of a decided opinion that by cross-cutting through the lode every 8 or 10 fms. will be quite sufficient to ascertain its size and quality; in the bottom of this level we have commenced stoning, the ore part of the lode is about 12 in. big, good saving work for copper. In the 50 or bottom level I am glad to state, the lode still maintains its very promising character, the ore part of the lode being 16 in. big in the back of the end, and increasing in size to 18 in. at the bottom, and I have no doubt in the deeper levels it will lead us to large deposits of ore.—H. CHOAKE: May 19.

DEVON-AND COURTAULD CONSOLS.—The 30 fm. cross-cut, north from engine-shaft, is in 8 fms.; and this day we have cut a branch of mundic 2 in. wide, underlaying north, which will intersect the lode; the ground is very good for driving—set on Friday to cut the lode, at 51. per fm.; the men can drive 9 or 10 ft. per week; the ground in deep adit, on south lode, is easier for driving, now set for 62 per fm.—lode 20 in. wide, composed of mundic, killas, spar, with some ore in places; the ground in shallow adit is very easy for driving—four men in last month drove 18 fms., and the end is now set for this month at 2L 2s. per fm.—the lode is 18 in. wide, composed of flookan, spar, can, lead, and mundic. In consequence of the slow progress that the men made in sinking the flat-rod shaft, we thought it the most judicious plan to suspend the sinking, and rise from the end (when it was under) against the shaft.—JONES JON: May 15.

DRAKE WALLS.—Since my last report of the above, I see no alterations worth notice. I hope to sample 20 tons of tin in two months from our last sampling; and from our present prospects, I shall continue to increase our returns in proportion to our laying open ground, which is doing with all possible speed. We hope to commence sinking engine-shaft below the 50 at the end of this month.—RICHARD WILLIAMS: May 15.

EAST ALVENNEY.—We shall put the wheel to work on Thursday next; we should have done so before, but the weather has been unfavourable. We have all the pumps in order to sink on the north lode; we have a man clearing away the deads from the side of the north wall of the lode, so as to get the launders in to carry off the water, and so doing, he has found some excellent stones of tin ever I saw. We are also preparing to throw a lift of pumps on the middle lode. I am happy to inform you, that the agent sent here last week, says we are sure to have abundance of tin; and that he never saw a more kindly strata for tin.—J. SPARO: May 19.

EAST CROWNDALE.—The ground in our engine-shaft continues on in a clear blue killas, of a close texture. The sumpmen are now going to begin to cut the plat, and also fix the bearers and cistern for a standing hit, which we shall proceed to do with all possible expedition. The lode in the shaft, sinking on the north lode, is about 16 in. wide, composed of spar, capel, peach, mundic, and spots of tin; from the appearance of the lode there is every prospect of an improvement here very shortly. The ground in the adit level, towards the Eix Hill lode, is still stiff; the end is now driven upwards of 30 fms. We are getting on with the repairs consequent on the fire of our engine and boiler-house, which will all be roofed in on Monday. Our engine never worked better than it does at present; the pit-work is also in good repair. I am glad to say, that on carefully estimating the cost of repairs occasioned by the fire, the cost will not be more than about from 600 to 700.—S. PAUL: May 15.

EAST TAMAR CONSOLS.—At Whitsun, we have put the shaftmen to open the ground between Hitchin's shaft and the lode in the 64 fm. level to prepare for sinking; the lode in this level north and south is 4 in. wide, work of a good quality. The lode in the 60 fm. level north is 18 in. wide, composed of capel, spar, and silver-lead ore; the lode in the 60 fm. level south is 18 in. wide, good work. The lode in the 64 fm. level north is still in silty ground; the lode in the 54 fm. level south is 14 in. wide, composed of capel, mundic, and

ore. The lode in the 46 fm. level, south from Goud's shaft, is 2 ft. wide, fluor-spar and silver-lead ore. At Furzehill, the lode in Harrison's shaft is sunk 15 ft. under the 46 fm. level; the lode therein is 20 in. wide, saving work. The lode in the 46 fm. level north is 18 in. wide, work of a good quality; the lode in the 38 fm. level south is 2 ft. wide, producing good stones of ore. The lode in the 38 fm. level south is 20 in. wide, saving work.—B. ROBINS: May 17.

GREAT MICHEL CONSOLS.—The engine-shaft is down below the 22 fm. level 11 fms. 4 ft. 6 in.; the lode in which is without alteration, still composed of spar, mundic, fluor, and stones of ore. In the western winze the lode has a promising appearance, producing some good grey, black, and yellow copper ore.—T. RICHARDS: May 8.

GUNNIS LAKE.—At Chilsworthy, the lode in Bailey's engine-shaft is 2 ft. wide, composed of capel, spar, and ore. There is no alteration in the 12 fm. level east, composed of capel, spar, and ore. There is no alteration in the 12 fm. level east and west.—W. RICHARDS: May 18.

HAWKMOOR.—In the 15 fm. level, east of Hitchin's shaft, we have, in driving north in search of the lode, met with a small branch or lode—capel and spar of ore; we do not consider this to be the main lode, and, therefore, intend driving still further north.—P. RICHARDS: May 18.

HEIGNSTON DOWN CONSOLS.—The lode in the 20 fm. level, north of north shaft, is 3 ft. wide—good work for tin; in this level west the lode is 3 ft. wide, composed of peach, spar, and tin—good work. The lode in the pitch, in the back of this level, is looking favourable.—W. RICHARDS: May 18.

HOLMBUSH.—The diagonal shaft is sunk 4 fms. 8 ft. below the 120 fm. level, the ground, and branches in which, are just the same for speed, size, and appearance, as when last reported on; we hope, now the diagonal rods and lift are fixed, to make greater progress in sinking than we have heretofore.

The lode in the 120 fm. level, west of the great cross-course, is 12 in. wide, composed of spar, mundic, killas, and stones of ore; the lode in the 120 fm. level, east of Hitchin's shaft (on the north part), is 20 in. wide, composed principally of mundic, with stones of ore of good quality. The lode in the 110 fm. level, east of Hitchin's shaft (on the south part), is much the same as last reported on; the lode in the 110 south is 20 in. wide, composed of spar, prian, and lead, worth 62 per fm. The lode in the 100 fm. level south is 8 ft. wide, composed of spar, and lead, worth 92 per fm.; the lode in the rise, above this level, is 2 ft. wide, composed of spar, prian, and strings of lead, worth about 54 per fm. The lode in the 90 fm. level south is 24 ft. wide, composed of spar, with strings of lead, all of which is saved for dressing. We hope to get the wheel of the small stamp fixed in its place this week, and no time shall be lost in making it complete for stamping the lead halvans.—W. LEAN: May 18.

KIRKCUDBRIGHTSHIRE.—In the 40 fm. level nothing has been done since my last; the men engaged here having been employed fixing the railroad down, which is completed, as well as doing hung and road fixed thereon in the 30 fm. level, in place of the penthouse. The lode in the end west, in the 30 fm. level, is as large as usual, but not so rich—say worth 62 per fm.; the end, east on the caunter, produces about 1 ton per fm., lode large and regular, with the exception of a steep incline than before; the rise on the junction continues to look much the same as last reported, worth 40 per fm.; but we are greatly annoyed here by want of ventilation; the lode in the end, east of shaft, in this level, not having improved, we have considered best to suspend it until better ventilation is effected; we have, therefore, put these men to sink at surface over the men rising in the 30 on the junction. The lodes in the 20 fm. level, both east and west, are without alteration, and we are also labouring under inconvenience here, by want of native ventilation. We have erected a second air-machine—so that a constant blast of air is forced into the 30 west. The stopes, in back of the 30 fm. level, look remarkably well.—J. BUZZO: May 15.

LANIVET CONSOLS.—We are cutting through the lode in the 80 fm. level west, in order to drive on its south part; we have cut into it 5 ft., it is composed of capel, spar, and some good stones of yellow ore; in the 80 fm. level east, we are driving on the south part of the lode, which is much as last reported. In the 30 fm. level east, we are driving on the north part of the lode; the leader part is 2 ft. wide, good saving work. We have for our sampling on Monday next, 100 tons of ore.—H. WILLIAMS.

LEWIS.—I am glad to inform you of one improvement—that is in tin shaft, sinking below the 50 fm. level, where we have sunk, since last Saturday, about 2 fms. in a lode 2 ft. wide, worth 122 per fm. for tin. I should be very much pleased to inform you, that we have such a lode in the 60 end, east of copper ore shaft; but it is not as yet, though saving work for tin, and very promising. I am hoping we shall find some part of this good lode at the 60, as we extend east; if so, the improvement will be still more cheering. All other places are much the same as when last reported; both our stumps are doing very good duty, according to the number of heads they are stamping. We have determined on adding some more stamp heads to our stamping—We shall lose no time in getting through the work.—S. S. NOEL: May 15.

LOSTWITHIEL CONSOLS.—The branch has declined again, and the end is harder; it continued several feet, and evidently widens in depth. You shall have the specimens of ore in time for the general meeting of the 27th, and I will take care that the ore assayed is similar to that may be sent. The presence of such decided indications of metal will not, I think, deceive us—*tempus dicit*, and favourably, too, we do not doubt.—JOHN OFFORD: May 15.

LYDFORD CONSOLS.—I am happy to say, the mine is looking very well at present—I think more promising than ever I saw it; I cannot say there is more lead in the south adit end than ever I saw, but the general appearance of the lode and the country by it is looking much more promising for making a bunch of lead than when you were here; I mentioned in my last that the middle of the end was not looking so well as the back and bottom, neither is it now; but we have a lode in the back of the end nearly 2 ft. big, good saving work for about 2 ft. down in the end; and in the bottom of the end we have a lode about 18 or 20 in. big, good work for lead; there is lead in the middle of the end, it is not so good as the back and bottom; it seems very plain to me that this lead in the bottom of the end is another shoot of lead rising up and underlaying north in the same direction as the other, and this little piece of ground in the middle of the end is a little dead piece of ground between the two shoots—this is my opinion of it; but, however, in the course of a short time I shall be able to give you a better explanation of it. We have all the water in the end that was coming from that large lode behind when you were here; I think this shows very plain they must be together just before us; we have a large capel in the eastern side of the end, with spots of copper in it.—J. JENKINS.

MENDIP HILLS.—The lode in the 88 fm. level, south of Stainsby's shaft, is about 5 ft. wide—the appearance of which continues much the same as for several fathoms past, composed of flookan and white spar, intermixed with lead; ground favourable for driving, price 40s. per fm.; I have this morning placed some men to prepare for sinking a winze below this level, about 30 fms. south of shaft, in order to get under the cavern gone down from the 18 fm. level; should the ground continue as it now is, the cost of sinking will not exceed 55s. or 60s. per fm. In the slag department our operations during the past week have been very favourable indeed; the large bed of slag, from which the rubbish is now being removed, looks remarkably well, both as regards quantity and quality. I hope to get a load of timber on the mine to-morrow, when we shall commence immediately making launders, and get the water around the hill as far as possible.—F. G. HARFUR: May 17.

NORTH WHEAL FRIENDSHIP.—The lode is much improved, and the ground eased from 102 to 62 per fm. We are continually breaking most excellent stones of tin. We are saving all the lode for the stamps, which is 2 ft. wide. I never saw a better pile of tin than we have at grass from such short levels.—J. SPARO: May 19.

SILVER VALLEY.—At the engine-shaft the cross-cut towards the tin lode is driven 1 fm. 2 ft. 6 in., and the ground is favourable. We have now 22 tri-butars at work, and shall raise a fair quantity of tinstuff this month. At the silver mine, the lode in the 30 fm. level is divided by a horse of killas, the south branch appears to be the main part, and is composed of flookan, carbonate of iron, and mundic; the north branch is small, but has a kindly appearance, and will again, no doubt, fall in with the main part going westward. In the 20 fm. level west the lode is about 15 in. wide, containing spots of lead, and small particles of silver, and has a promising appearance, the ground being more favourable than it has been for the last 14 fms. driving; the lode in the stopes, in the back of this level, is producing some good work, and, upon the whole, it looks better now than it has since we commenced stoning.

In the 10 fm. level, in which the lode is about 8 ft. wide, worth 122 per fm. The north end, in the 10 fm. level, is now forth about 12 fms. from this winze; the lode still looks very well, but not quite so good as when last reported; it is now about 4 ft. wide, worth 30s. per fm.; we have recently cut in this end either an east and west lode, or a very large branch; we have not sufficiently opened it yet, to ascertain what it is, the underlay is north, and producing excellent stones of tin, and is about 2 ft. wide, worth 10s. per fm.; we shall commence to drive on it as soon as possible—if it continues to do so, this will be another great improvement. We hope to return between 2004 and 3002 worth of tin this day fortnight.—JOHN DALE: May 19.

WHEAL CONCORD.—May 6.—There are now only six miners employed underground—viz., two rising above the 20 fm. level west, where there is a promising lode, 2 ft. wide; and four driving the 28 fm. level west, through a lode 5 ft. wide. The dressing pare will get all the ore marketable by the end of this week, which will be about 2 tons. Permit me to offer a few supplementary remarks to my report of the 19th of April, and other letters in reference to the future government of the mine. I consider the 20, 28, and 38 fm. levels west should be vigorously prosecuted, and that six men should be employed to rise above the 20 on the lode, and six to sink towards them, below the 28, for the engine-shaft; and when they hole, to commence immediately, and sink below the 38. One level, at least, should also be driven east on the lode, and the rise continued above the 20 west, as well as the 38 cross-cut south, towards the southernmost lode, which I think about 11 fms. before the end. This is the plan which I judge most likely to bring the mine into a profitable state. There are about 75 fms. between our western end and the boundary of the sett—beyond which, about 86 fms., Wheat Grace Company are carrying out vigorous operations; and this, added to the promising aspect of the lodes, should be a fresh stimulus to your perseverance and exertion. To carry on the works enumerated above, would require 40 miners, who, with the necessary labourers, staff, and materials, would cost from 300L to 310L per month.—May 13.—We have rose 84 fms. above the 20 west, through a lode which averages 2 ft. wide, producing good stones of lead, intermixed with spar, flookan, blonde, &c.; this rise is now suspended, and the men are driving the 20 west, where the lode is 2½ ft. wide, soft killas, spar, and mundic. In the 28 west the lode is 4 ft. wide—quartz, and spots of lead. I consider the lodes in both these ends of very promising character.—J. B. CLYMO.

SOUTH WHEAL TRELAWNEY.—Sobey's lode, in the adit south is about 2 ft. wide, composed of gossan, white killas, soft spar, mixed with a great deal of white prian—ground favourable. The cross-cut, west of Snell's shaft, is still driving—the ground favourable and water favourable.—W. JENKIN: May 17.

STRAY PARK AND CAMBORNE VEAN.—In the rise, above the back of the 60 fm. level, the lode is 2 ft. wide, yielding 4 tons of ore to a fm., worth 72 per ton; in the 60 end, driving west, the lode is 20 in. wide, yielding 8 tons of ore to a fm., worth 72 per ton; in the 60 end, driving east, the lode is 1 ft. wide, yielding 4 tons of ore to a fm., worth 72 per ton. In the 70 end, driving west, the lode is 8 ft. wide, yielding 4 tons of ore to a fm., worth 72 per ton. In the 80 end, driving west, the lode is 1½ ft. wide, yielding 8½ tons of ore to a fm., worth 72 per ton. In the 90 end, driving west, the lode is 8 ft. wide, containing very little ore. In the 100 end, driving west, the lode is 8 ft. wide, yielding 5 tons of ore to a fm., worth 5½ tons per ton; in the winze, sinking below the 100 fm. level, the lode is 3

WHEAL EMMA.—In the engine-shaft the killas is of a green colour, and more favourable for sinking. In the 22 fm. level east the north lode is from 3 to 4 ft. wide, composed of capel, mundic, and spar. In the adit level, Brookwood, the lode is large, composed of capel, flockan, and soft spar and mundic.

—H. CHOAKE: May 10.

WHEAL SAMSON SILVER AND GOLD MINE.—Our operations are now confined to driving on the south lode or branch described in my report of last week as the flockan lode. As we drive towards the junction the ground is rather stiffer, but the lode is larger, with two good walls, and we are occasionally breaking small stones of rich silver-lead ore. I have a sample of about 3 or 4 cwt. from this mine, which I wish send you as soon as you inform me how, or where, I shall send it.—J. SPARGO: May 18.

WHEAL SOPHIA.—We have commenced Boundy's shaft, timbered up the collar, and are now sinking in firm ground. This shaft we intend sinking 20 fms., cut plat, and drive a cross-cut 10 fms. north, to intersect the lode, which is underlying south, which will give ventilation to the adit; also, drive south, and intersect the Graston lodes that underly north, and will form a junction with the lode we are now driving on 50 fms. deep. The lode in the adit is improved—from 6 to 7 ft. wide, composed of capel, mundic, and copper ore.—H. LUKE: May 19.

FOREIGN MINES.

IMPERIAL BRAZILIAN MINES.—*Gongo Soco, March 18.*—Since my last, we have obtained a few hat caps of inferior work for the washing-house from the shallow level, near Pengilly's shaft; but I am sorry it has not much raised our hopes, although it may continue to give us small quantities occasionally. The eastern part of the mine, near Bailey's shaft, seems to be quite exhausted, and will neither pay the cost of further working, nor hold out hope of discovery. The other parts of the mine present nothing worthy of notice. At the moment of writing, Gongo is full of the proprietors of Bananá—their representatives, or lawyers. I expect the official documents will all be made out to-day, and that we shall be in full possession within three days. I trust this will be a sufficient explanation of any omissions, or errors, you may observe in this letter.—Gold workings from 3d to 12th March:—5lbs. 0 ozs. 7dwt.

—W. J. HENWOOD.

ST. JOHN DEL REY MINES.—*Morro Velho, March 9.*—Produce for February: Morro Velho, 12,246 oits.; Cata Branca, 176-9 oits. = 12,422-9 oits., or 11,934-5 lbs. troy. The Morro Velho produce is from 2828 tons of ore, equal to 4-83 oits. per ton; this includes 256-8 tons of previously rejected ores—consequently, the yielding per ton must be considered good.

Mine Report.—During the last three months, instead of rejecting ores from the spelling floors, we have been under the necessity of bringing in and stamping 265-4 tons of rejected ores; and, as these are estimated at 14 oits. per ton, while the raw ore from the mine is estimated at 44 oits., there arises a deficiency of 2656-2 oits. in the produce, from the supply of ore not being equal to the stamping-power; and, since we ought to have rejected at least as much as we have brought in, the deficiency may be considered as double this amount, or 5312-4 oits., which, clear of 5 per cent. duty, is 1900. net deficiency, or loss, in three months, arising from one cause or another. Capt. Treloar explains the various causes which have operated against the full supply of ore in February, the chief of which are now removed—viz.: difficulty in hauling and mine superintendence. The number of horses has been considerably augmented from one source or another—so that, for the present, there is no difficulty in this respect. The East Cachoeira Mine is a main cause of keeping back the supply of ore; so difficult is it to bring on the stoves in this section of the mine, to take up their position in succession of those of the Middle Cachoeira, that in order to prevent the Middle and West Cachoeira stoves from being consumed too fast, before those of the East Cachoeira can follow up, I have recommended Capt. Treloar to stop working the Middle and West Cachoeira for a time, in order to allow the lagging stoves to come up. We shall feel the benefit of this afterwards, and I think the stop could not be adopted more opportunely than at present, when the cost is low, and the produce, comparatively speaking, well maintained. The deficiency of ore for March, will, probably, be great in consequence, for the Middle and West Cachoeira are some 33 ft. wide, where ore can be abundantly broken. During this act of self denial, the loss of the 33 fms. in length of lode in Quebra Pannella is inconveniently felt; but the inconvenience of having consumed the best stoves in the great Cachoeira, before others were ready to replace them, would be greater, and that, perhaps, at a time when we may have few borers. The above estimate of the loss of produce shows very strongly the necessity there is of having the mine kept in good working order, and of keeping it fully manned to a certain extent—say to the amount of 200 borers. Nothing can exceed the vigilance of Capt. Treloar, but it is very up hill, in a mine of this very hard nature, to bring up arrears of work. It is now two years since Capt. Verran left, and we have not yet succeeded, besides which the East Cachoeira has led to some disappointment. There has been a large quantity of timber put into the mine in February, about rs. 600 worth.

Mechanic Report.—The mechanics have been employed principally in completing and perfecting the hauling machine for the Cachoeira and Gama Mines. It has involved a great deal of work at all the shafts, fixing rollers, &c., the quantity of iron consumed for these things is immense; this week will, I trust, see all this new hauling apparatus complete. The saving which I have inserted in my diary, as being effected by the new hauling machine, is only that actually effected; but there is no doubt that, during the present year, the expense of hauling with horses would have increased very considerably beyond the expense of 1846—for my own part, I am very glad the wheel-pit for the 40 ft. tumbler, in otherwise we should have been drawing the whole of this year with horses; and, in fact, the idea of bringing the Christias water across the brook in the syphon, is “luckiest hit” that could have been made for Morro Velho in its present position; without this the cost would have exceeded every bound.

Mine Report.—I have already informed you, that I have cut short the purchase of any more timber until the 1st April next. The supply has still been very good in March, no timber will be purchased; but I dare say in April there will be a shower again; when I find it inundating, I shall make another stop. With respect to giving up our cart department, I shall keep all our cart men until I find that the hired carts take kindly to the work, out to our depot at Cardoso, at the rate of rs. 2 560 per day. The roads have been too bad lately for them to go out there, and the carmen have been talking of raising their hire to rs. 2 880. The whin animals are all got rid of, and the Tropa Grande is now also being reduced in consequences.

Cost for February.—rs. 20,306 646 = 23697. 2s. 2d. A combination of circumstances has tended to render the cost unusually low for February. There are deductions for stores and whin horses sold, and discounts to the amount of rs. 1941 900; there are no English costs; very light costs from Rio, only rs. 483 940; very little carriage of any kind, principally attributable to the bad state of the roads from continuous rains, and the cutting short the purchase of timber; and, at the same time, a real reduction was effected during the early part of the month, in expense attending the whin horses.

WHEAL CONCORD MINING COMPANY.

An adjourned special general meeting of adventurers was held at the offices King-street, Cheap-side, on Saturday, the 15th inst.

HENRY ENGLISH, Esq., in the chair.

The circular convening the meeting, with the minutes of the preceding meeting, having been read, Mr. W. SNELL wished the meeting to understand, that the cause of the adjournment from the 11th inst. was not to be attributed to the purser. He was without any notification from the office of the intention to adjourn, although it had been positively stated by Mr. Crofts that a letter had been forwarded by post, which, he had no hesitation in saying, had never come to hand; and hence he was not present at the meeting held on the 11th inst., which it was essential should be held, so as strictly to adhere to the rules by which the company was governed.

The CHAIRMAN proceeded to state the object for which the adventurers had been called together; such being to receive a report from Capt. Lean, who had been requested to inspect the mine, as also a communication from Capt. Clymo, the resident captain, which would be submitted to the meeting; and, further, to consider and determine upon increasing the capital of the company by the issue of 1024 new shares, at 30s. per share, as mentioned in the circular.

The report of Capt. Lean was read, of which the following is an abstract:—

In speaking of the 10 fm. level, Capt. Lean observes, that such has been extended 100 fms. east and west of the engine-shaft, which had been very productive for about one-third of that distance, averaging 5 ft. wide, the underlay being 4 ft. in a fm.; the lode, however, in driving east and west, had become unproductive, and diminished in size, having only occasional spots of lead. The 20 fathom level has been driven 54 fms. east, and 65 fms. west—lode averaging 3 ft. b. g., containing some lead, accompanied by a hard capel, the ore ground being of much the same extent as that in the 10, the other parts being in like manner unproductive. At 30 fms. east of the shaft, the lode is split, or taken “horse,” the north part being 4 in. b. g., on which about 4 fms. have been driven. On the south branch they have driven 24 fms.—the lode poor and unpromising; the lode as well as strata of the country being more compact and hard, while the nature of the ground in which the lode made ore was the reverse. A cross-cut has been driven from the point of horse about 34 fms., and, in course of driving, a lode intersected, 14 in. wide, with a north underlay, of an unpromising character, on which a lode has been driven 9 fms., the lode being unkindly. About 7 fms. further south, another branch was intersected, but very irregular. The lode in the western end is 3 ft. b. g., composed of soft spar and decomposed clay-slate, in which stones of lead are found. “The lode in the present end presents kindly indications for lead.” This level is within 25 fms. of the western shaft, which is 16 to 18 fms. below adit, and to within 50 fms. of the western boundary. A rise has been made 8 fms. above this level, where the lode is found to be regular in size and underlay. The 28 fm. level has been driven 53 fms. east, and 64 fms. west, the lode averaging 3 ft., with occasional spots of lead—“the present end has a more promising appearance for lead than for many fms. east of it.” It is probable, that on intersecting the cross-course said to be west, that another shoot of lead may be found in driving some few fms. In driving east in this level, for the first 10 fms., the lode was productive, but the present end is poor. The 38 fm. level has been driven 21 fms. east and 60 fms. west—the lode 2 ft. b. g., composed of hard spar, with spots of mundic and lead; the ground is more dead, and harder than in the upper levels. A cross-cut has been driven south to intersect the first south lode, or branch, which has been driven on a few fms., but is unpromising. The 50 fm. level has been driven on 14 fms.—the lode is 18 in. b. g., underlaying about 5 ft. in a fm., without mineral, and holding out little or no promise.

As ore ground appears to have made above the 28 fm. level to within a few fms. of surface, all the ore ground being taken away for an average length of 25 fms., but below that point, no lead appears to have been raised in the former or present workings—the lode, in holding down, being diminished in size, and harder, with a quicker underlay. The cost of sinking the engine-shaft may be taken at 200 per fm., the lode underlay fast away from it, and, therefore, requiring cross-cuts of some extent; while “there is not to be seen one particle of copper, blonde, gossan, prian, and not many specks of mundic throughout the entire length and depth of the explorations below the 28 fm. level.” Capt. Lean, in closing his report, recommends setting the 20 and 28 fm. levels, to drive west by six men in each, which being extended to the cross-course referred to, occupying two or three months, will prove a guide for future operations, and if the result be not attended with success, then to abandon the mine. Capt. Lean further observes, that the set is very limited, both east and west of the present workings. The latter observation appears to be in error, and grounded on the plan of the mine as formerly granted. As regards the western boundary, Capt. Lean is quite right, it being bounded by Wheal Grace. The

ground east, however, it was stated at the meeting, extends very considerably beyond the line drawn on the plan.

Letters from Capt. Clymo were then read, which will be found in our Mining Correspondence.

A lengthened discussion ensued, as to the objects for which the meeting had assembled, which in the end was determined by a resolution being carried to the effect, that 1024 new shares be created, and that the same be offered to the adventurers, *pro rata*, at 30s. per share; it being understood, that if the same be not taken up within 10 days, the purser and secretary be authorised to dispose of all such shares, or so many as may remain unappropriated.

Mr. E. F. DAYRELL wished it to be clearly understood, that the amount to be raised by the issue of new shares should, so far as was necessary, be applied to the purposes of paying off the debts or liabilities of the mine; and that the surplus arising therefrom should be placed to the general account of the company, and appropriated to the prosecution of the workings. He (Mr. D.) moved a resolution to such effect, which was adopted.

Mr. ENGLISH (as auditor) considered it a duty imposed on him to state, that he had not up to that time been put in possession of the vouchers necessary to pass the accounts, and begged that some steps be taken for their production.

Mr. PETER DAVEY fully concurred in the necessity of the vouchers being forthcoming, and accordingly moved that a letter be addressed to the clerk at the mine, requiring him to transmit without delay, the several receipts and vouchers in his possession for monies paid.

Mr. W. SNELL begged to refer to the accounts which had been transmitted by the purser, and the vouchers, as fully clearing him from any charge of withholding the documents required—the monies having, since July last, not passed through his hands. He begged to refer to Mr. Crofts, as secretary, at once admitted, and that the accounts of the purser were perfectly correct, and further stating that the monies had been forwarded to the clerk at the mine. He (Mr. Crofts) wished it to be clearly understood, that the remarks made, having reference to the absence of vouchers, did not apply to the payments made, or expenses of the office, or to himself, as secretary, although he admitted it was the duty of the secretary to see that all vouchers were furnished and recorded.

A general conversation ensued as to the affairs of the company, and the vouchers which the mine presented, and the several resolutions which appear in our advertising column having been carried, the meeting adjourned until Thursday, the 27th inst.

X WHEAL CURTIS MINING COMPANY.

A general meeting of shareholders was held at the offices of the company, Gresham Rooms, Basinghall-street, on Tuesday, the 18th inst.

Captain PILKINGTON in the chair.

The advertisement convening the meeting for the 4th inst. having been read, with the notice adjourning the same, Mr. THOROGOOD rose for the purpose of inquiring whether there was any person present who was not a shareholder in the company.

Mr. BULL, as solicitor of the company, and holding a large number of shares, observed, that he could see no objection to parties being present, although they might not hold an interest, inasmuch as he believed the object of the shareholders was that publicity might be given to their proceedings—in which opinion the Chairman expressed his perfect concurrence; and as he believed no one was present but the reporter of the *Mining Journal*, who was not interested, and feeling well assured that the proceedings would be fairly conducted, he thought the meeting might at once proceed to the objects for which it had been convened.

The report of the directors, with the accounts, was then read; and, after numerous applications at the office, we have not been furnished with the one or other, and hence our notice, or abstract, must be necessarily imperfect. From the report, and the observations made relative thereto, it would appear that 4891. 16s. 8d. had been expended, which had been met by the amount received on the sale of shares, 3405. 16s., and loans of 1486. 18s. 8d., there being a trifling difference in making up the accounts, which, however, had been submitted to an experienced accountant. It was stated, that 5257. 8s. 8d. was the amount of liabilities, including the loans; this, however, does not accord with the accounts to which we have referred. It was proposed, with the view of liquidating the claims on the mine, to distribute the shares which had not been taken up at a reduced price, so as to meet the debts and current expenses. The machinery and implements had been valued at 2324. 1s.; and in six months the returns, in the way of profits, might be estimated at 1300. With respect to the further outlay that might be necessary, it was considered that 400. would be ample; and that, from the results of the former working, as well as the opinion entertained by Capt. Crase, at least 10,000. would be returned from the Charlotte lode, and a profit of 20 per cent. secured to the shareholders.

The CHAIRMAN, in explanation of the report with reference to the issue of shares, observed, that any shareholder holding 20 shares, would be entitled, on the payment of 10s. per share thereon, to 2-9ths, or eight new shares, on which the sum of 40s. per share would be considered as paid—thus completing the issue of the whole number of shares of which the company is constituted, such being subject to the further call of 40s. per share.

The SECRETARY stated, in reply to a question put by a shareholder, that the call of 30s. per share had been responded to on 3659 shares, while there were 425 shares in dispute; thus making the actual number of shares of which the company might be considered to be composed, 4120.—The report having been received and adopted,

The CHAIRMAN observed, that several parties had expressed their opinions on the system to be adopted for prosecuting the operations of the company, whether on the Cost-book System, or under the Joint-Stock Company's Registration Act. He wished the subject to be brought under the notice of the meeting, so that their opinion might be arrived at, as there was one object in view on the part of his co-directors and himself, that the wishes of the majority of the proprietors should be met, without regard to any opinions they (the directors) might entertain.

Mr. BULL begged to state, that he considered the Joint-Stock Company's Act gave to the shareholders an advantage over the Cost-book System—inasmuch, that by the former, a shareholder, who should have been proceeded against for any debt due by the mine, had his remedy against his co-adventurers, by a summary course of proceeding. He considered a Deed of Settlement preferable to the Cost-book System, under which each mine “stands on its bottom,” and must be worked independently—whereas, by observing the course proposed, and which he upheld, the directors might embark in other mines under the same deed. By adopting the deed then before him, a power would be acquired, giving to the directors the advantage (?) of taking fresh sets. He begged to direct the attention of the meeting to the expenditure and the value of the property on the mine; he had before him a detailed estimate, from which it appeared, that the real value of the materials, &c., was 3676. 19s. 7d., irrespective of the workings, &c., in exploring the mine. He would only further observe, that, with the highly-gratifying report made by his agent, as to the prospects presented, he could not but consider that the distribution of the unappropriated shares, on the term proposed, was “a boon as great as ever had been offered”—while the capital of the company was never likely to be extended; but, on the other hand, from the profits of the mine, the workings would not only be extended, but other properties acquired.

Mr. THOROGOOD observed, that the original prospectus limited the liability of the shareholders; he wished to know, whether such formed a part of the deed, as he considered it was one of the most important features.—The SOLICITOR of the company could only refer the meeting to the Act, which provided that, in case any party should be proceeded against, he should have a remedy from his co-adventurers, in proportion to their respective interests.

The report of Capt. Crase having been read, he proceeded to state that the opinion he entertained, and which was expressed in the document submitted to him, was supported by practical men like himself. He considered that the question, as to Wheal Curtis making a mine, could not for a moment be entertained, inasmuch that they were now close advancing to the time when ore would be raised, and the value of the mine tested. At the period of working the mine by the old adventurers the lode had been lost sight of, many hundred tons of which having been thrown away, which would give 1000 to 100 sacks, and worth 30t. a ton. He (Capt. C.) had been an agent for 30 years and upwards, and believed there was not a better set in Cornwall. Nothing had yet been done underground for, in fact, they could only say they had been at work for the past two months, and the engine was not yet to work, so as to get the mine in fork.

A lengthened discussion ensued, on the subject of the Cost-book System, and the Joint Stock Company's Registration Act; but the absence of any novel feature, and the general want of information displayed on the part of those who took part in the proceedings, rendered it only necessary to advert to the matter; while, in the end, the Joint Stock Company's Registration Act was adopted, without rhyme or reason, so far as we could collect. There can be no doubt, but that the solicitor and registrar will derive some advantage from the course adopted.

A PROPRIETOR observed that, as regards liability, that was easily avoided, by any shareholder transferring his interest to a “man of straw,” for a nominal consideration.

This appeared to be deemed satisfactory and convincing on the part of the meeting, the Joint Stock Company's Registration Act was accordingly adopted. The deed was then read and adopted, the directors and other officers appointed, and the meeting separated.

X NORTH WHEAL ROBERT MINE.

At a meeting of adventurers, held at the Guildhall, Tavistock, on Wednesday, the 12th inst., J. W. FLAMANK, Esq., in the chair.

The accounts to the end of April were passed, from which it appeared that the arrears of calls due amounted to 112. 10s., and by the call of 10s. per share, made March 21, 128.—together, 240. 10s.—Creditor, by costs for March and April, 85. 18s. 1d.; balance due, 97. 9s. 7d.; arrears of calls, 121. 7s.; part of debt to bank paid, 12. 18s. 4d.; balance, 117. 4s.—together, as above, 240. 10s. Merchants' bills, debt to bank, 167. 9s. 9d.—Creditor, calls due, 121. 7s.; cash, 107. 4s.; balance, 367. 6s. 9d.—together, 167. 9s. 9d.

It was then resolved, that a call of 16. per share be made, 10s. payable immediately, and 10s. on or before the 1st of June next.—That the purser be authorised to sue, through a creditor, every shareholder whose calls are in arrear after the 26th inst.; and that the shares of all defaulters after that day be forfeited.—That any shareholder may, by signing a proper relinquishment, surrender his or her shares, on payment of arrears, before the 1st of June next; and that persons so retiring, shall be entitled to receive their proportion of the estimated value of the materials, &c.—That Capt. Carpenter be requested to make an inventory of the property of the company, on or before the 31st inst.—That the resignation of the committee be accepted, and that Messrs. J. W. FLAMANK, J. PHILIPPE, E. TURNER, J. CARPENTER, and J. SECCOMBE, fill that office until the next meeting.—The following reports, from J. PAUL, Esq., Mining Engineer, and Capt. W. HEATH, were read:—

Tavistock, May 12.—I have at the request of many of

engine, thou shouldest have ascertained the real power of each. If thou hadst done this, and fairly stated the result, I should have been, most probably, spared the trouble of disputing thy extraordinary assertions. I have, however, I must confess, a suspicion, that thy object in publishing the statement in thy circular, was to mislead, instead of to enlighten, the shareholders: and I am confirmed in this suspicion, as much by what is omitted by thy circular, as by what it contains. Thou knowest that the proposed steam-engine was intended to draw all the stuff from the mine, as well as pump the water. Now, this alone would effect a saving, even at the present depth, of about half the cost of working the engine; whilst its efficiency could be maintained, without much danger of its being washed away; and the vigorous prosecution of the mine could be continued, without those periodical and ruinous delays, inseparable from the present machinery, and its appendages. With the steam-engine, we should also have the satisfaction—now unfortunately denied us—of seeing the mine speedily and effectually tried, and the confidence of the shareholders and the public in the undertaking firm and unimpaired. The whole of these advantages have been destroyed, the hopes of the shareholders blasted, and their property almost ruined by thy advocacy of this miserable and inefficient machinery. So much for thy figures and "careful analysis," so triumphantly, and, as I believe, indiscreetly, paraded in thy circular; and I would add, so much for the "position assumed thereto by thee."

SAMPSON VIVIAN.

West Caradon, Liskeard, 5 mo. 19.

MINING NOTABILIA.

[EXTRACTS FROM OUR CORRESPONDENCE.]

The TRELLAWNEY meeting held at Liskeard, on Tuesday, was attended by several London and other out-adventurers:—viz.: Messrs. Mount, Browne, Chippendale, Woods, &c. Capt. Peter Clyme having resigned his situation as purser and manager, in accordance with the wish of the London adventurers, a committee was formed to consider upon his successor. In consequence of the expenses attending the erection of new engine, &c., the costs for January were heavy; but, nevertheless, there appeared a profit on the two months' working of 500L. The accounts show (adding 394L. 0s., balance of last account, to 600L, now paid towards the new engine) a balance against the mine of 693L. 17s. 4d. The mine looks well.

MARY ANN.—At the meeting held on Wednesday no call was made. The mine is looking well.

For HERODSCOMBE a small 18-in. cylinder engine has been purchased cheap, to crush the ores. The north end has improved considerably within the last few days.

TREHANE is looking well.

HERODSCOMBE.—The 62 is driven north of shaft 30 fms.; this end produces about one-third of a ton of ore to a fm.; there is still good grey ground for 8 fms. behind the end, which is now stoning. The 72, north of shaft, is driven 26 fms., the lode in the end produces half a ton per fm.; the 72 south is driven 28 fms.; the lode in the end is 16 in. wide, producing half a ton of ore to a fm.; the lode in the back of this end produces nearly 1 ton per fm., and there are good bunches of ore in the bottom of this level. The shaft is down to the 82 fm. level, and just commenced to drive, and expect in a month to cut the lode, and should it continue to improve in depth, as in the level above, the mine will soon leave profits.

HERODSCOMBE.—This sett is more than a mile in length on the course of the lode, which is 10° west of south, and underlays west 1 ft. in a fm. At the commencement of the mine a shallow adit was brought home at a distance of 50 fms., when the lode was intersected 20 ft. deep, and contained good stones of ore; driven north on the course of the lode 24 fms., in the present end the lode is nearly 34 ft. wide, producing about 8 cwt. of excellent silver and lead ores per fm.; about 10 fms. of ground in the back of this level are stoned away; the south end is driven 21 fms.; the lode in the end is 16 in. wide, producing good stones of ore; each of these ends decidedly improving, and congenial for lead. There are now on the floors about 5 tons of most excellent silver-lead ores, worth from 23L to 24L per ton.

WHEEL BAL.—The course of tin which has been discovered in this mine, has yielded several hundred pounds worth of tin, and has lasted several months, and of late it has much improved; at the present time it is 3 fms. long, and worth upwards of 70L per fm. The 45 fm. level end is driving, and we expect in a short period to be under the run of tin ground, as spoken of above; the lode in this end is of a very promising appearance, but is several fathoms behind the main lode; the backs in this level are set for 15s. in the 12; on the whole, the mine never looked better, and promises much for its shareholders.

INSTITUTION OF MECHANICAL ENGINEERS.

An important meeting of the members of this institution was held at the Queen's Hotel, Birmingham, on Tuesday last.—Mr. J. E. MC'NELL (superintendent of the London and North-Western Company's locomotive department), in the chair.

The SECRETARY (Mr. STACEY) having read the minutes of the previous meeting, the further consideration of Mr. Cheshire's paper on a new railway buffer, and of Mr. Knight's paper on breaks, was left over to a future occasion. The Secretary announced the receipt of a paper from Mr. Bessemer, recommending a division of the axles of carriages in the centre, to do away with the necessity of covering the tire. The first paper was read by Mr. BUCKLE, "On the use of the Fan-blast for manufacturing purposes," from which the following are extracts:—

"The subject of this paper is one of a series of experiments on the fan-blast, as applied to manufacturing purposes. They were made for the purpose of guiding the construction of the fan, so that the greatest quantity of air could be accumulated with the least possible expenditure of power. The original application of the fan was for the purpose of separating and dressing seeds, the speed and density of the air being limited to manual power. But since their application to smelters and foundries, steam and other motive power have been used, their speed being so increased that the density of the air ranges from 3 cwt. to 12 cwt. per square inch. Various forms of fans have been made, but the one generally preferred is called an eccentric, with three or six blades or arms radiating from the centre. This indispensable machine is one that has abridged much time and labour; the uniform stream of air admits of no comparison with the puffing blasts of the bellows or cylinder. The smith can heat his work with precision, proportion the size of his nozzle tuyere to suit his work, without deteriorating the intensity of the blast, and in some instances it enables him to heat one piece of work while shaping another, the pressure of the blast ranging from 4 cwt. to 5 cwt. per square inch, with nozzle tuyeres 14 inch diameter; but, in a well-regulated smelting, the nozzle is fitted with nose-pipes as ferrules, varying from 1 to 3 in. diameter, to suit the quantity of blast required. An eccentric fan 4 ft. diameter, the blades of which are 10 in. wide by 14 in. long, and running 870 revolutions per minute, will supply air at a density of 4 cwt. per square inch, to 40 tuyeres of 14 inch diameter each, without any falling off in density. In the first six experiments no discharge of air takes place, the velocity of the fan merely keeping the air at a fixed density or pressure per square inch due to that velocity. The remaining 26 experiments show the fan discharging air. An inspection of the table will show that under various conditions of velocity of the tips of the fan, that the density of the air, and the theoretical quantity of the air discharged, varies, but not in a direct ratio. The best results are obtained when the velocity of the tips of vanes coincides with the velocity, and 9-10ths of the velocity a body would acquire by falling freely the height of a homogeneous column of air due to its density. This is what we have called the theoretical velocity; or, in other words, the greatest quantity of air is discharged by the fan with the least expenditure of power when the tips of the vanes move at these velocities.

In a recent set of experiments, the inlet openings in the sides of the fan-chest were contracted to 12 in., and 6 in. diameter—the original diameter being 17½ in. The results obtained were, that with the 12 in. openings, the power expended was 24 to 1 compared to the openings of 17½ in., the velocity of fan, the density of air, and the cubic discharge being the same. With the 6 in. opening the same results followed as with the 12 in., only the density of air decreased one-quarter. These experiments show that the inlet openings must be of sufficient size that the air may have a free and uninterrupted action in its passage to the blades; for if we at all impede this action, we do so at the expense of power. Here follows a copy of the tables of 53 experiments, after which the paper gives the dimensions of fan employed in these experiments—namely, 3 ft. 10 13-16ths diameter; width of the vane, 10 1/4 in.; and the length, 14 1/4 in. The fan is eccentric 1 7-16ths in. the vanes are five in number, and are placed at an angle of 6° to the plane of the diameter. The inlet openings on the side of the fan-chest are 17½ in. diameter. The outlet opening or discharge passage is 12 in. wide and 12 in. deep; the space between the tips of the blades and the chest increasing from two-eighths of an inch, on the exit pipe to 8½ in. at the bottom, in a perpendicular line with the centre."

Mr. BUCKLE said, that he had found that the area of the discharge and the density of the air, corresponded very nearly. His object had been to show the quantity of the air discharged at a certain density, and the power it required to effect that result.

The SECRETARY read another paper which had been received on the same subject, from Mr. Jones, of the Bridgwater Foundry, Bridgwater; the sending of which had been suggested by his seeing the subject named in the advertisement of the meeting. The following is from Mr. Jones's paper:—

"These are, perhaps, no points upon which mechanics have had a greater variety of opinion than that of the application of the fan for manufacturing and other purposes; nor is there any other subject which has caused more disappointment; and I am decidedly of opinion that this has been principally occasioned by constructing the air passages too small in the fans, as well as the passages leading to the tuyeres. Facts are always better than opinions; and in offering the following statement, I merely give the result of six months' constant work. Two points of importance in the construction of fans are, an exact balance of the fan upon the axle, and a careful and judicious arrangement for getting up the speed so as to avoid either tight straps, or any slipping up on the pulleys. With this I forward you a drawing of the fans I have constructed. You will perceive that I have made the openings unusually large, but the results have fully justified the proportions. With these two fans we have been melting 50 to 60 tons of iron per day, at the rate of 5 to 6 tons per hour, with a consumption of 200 lbs. to the ton of iron; in addition to which there are upwards of 50 smiths' fires blown at the same time. The power required is about eight horses, the motion being taken from a 12-horse power engine by means of a 7 in. guita percha belt, the shaft running at 73 revolutions per minute. The speed of the fan is about 750. They are driven by a pulley on each end of the spindle. This I think much better than a single strap. The openings at the side of the fans are 2 ft. 4 in. in diameter, and the outlets are 24 in. by 12 in. The passage from the fan is 2 min. 9 sec. by 1 min. 9 sec., leading to a reservoir under the cupola 18 min. 0 sec. by 7 min. 0 sec., by 4 min. 0 sec. deep, from which we have two tuyeres 6 in. in diameter. The pressure of blast is about 5½ cwt. per inch. The only thing to which I wish to call your attention is the increased size of the air passages; and when we consider the large quantity of iron melted, and the small proportion of coke used, the result is very satisfactory."

Mr. BUCKLE remarked, that his paper had been drawn up for the purpose of recording a course of experiments made during a series of years at his mine, and which had been recorded with the utmost care. The results were important to those who were about to adopt him, as teaching them that his size must not be a matter of guess-work. "When he never had a fan made, all the advice he could get was, 'Make it big enough.' The persons who used to know nothing about it. Had he been then in possession of the results

of his subsequent experiments, he should have had his fan made only half its present size. He now found that all that was required was, that the tips of the fan should revolve with 9-10ths of the theoretical velocity. In driving the fan at that speed they would obtain the largest portion of blast at the least expenditure of power. By driving them at a greater velocity, the power was increased without producing a greater quantity of blast.

The CHAIRMAN said, that Mr. Jones's economy of power was very remarkable. He stated that he was working the fan with an engine of 8-horse power, and that the revolutions were 750 per minute. How did Mr. BUCKLE's experiments agree with that?—Mr. BUCKLE had worked his engine from 700 to 1500 revolutions per minute, but had recorded only 1300. Let the size of the fan be what it might, the law was that the tips should only revolve at a certain velocity. His fan was 3 ft. 10 13-16ths of an inch.

The CHAIRMAN wished to know, if Mr. BUCKLE had ascertained the relative values of long and short pipes?—Mr. BUCKLE had not had the opportunity of trying that. He had tested the power, having 40 of the holes in the pipe cut further out, and the same at the end next the fan open, and the difference in the effect was so small that it could not be measured. The CHAIRMAN got into the subject of the proper length of the pipe in a future paper.—The CHAIRMAN said, that the project was of great interest to himself, as he was about to lay down a number of pipes for the purpose of Wolverton.

Mr. COOPER wished to know, if the horse-power mentioned by Mr. Jones was indicated or commercial horse-power? Was it the same as that meant by Mr. BUCKLE?—Mr. BUCKLE said, he had ascertained the power by a dynamometer, having a spiral spring and a piston attached.

Having ascertained the amount indicated by the engine when disconnected with the fan, he had deducted that amount from the amount shown in every experiment. The engine was nominally a 14-horse power engine. He had found that by a succession of fans, the first transmitting the blast to the second, and so on, he obtained by the third or fourth a pressure of 24 in. of the square inch.

Alderman GEACH remarked, that this plan was in use at a furnace fitted up some three or four months since in Derbyshire, where they proved that they could obtain a pressure of 21 lbs. on the square inch, and that they could make better iron, and in a larger quantity, than by the old plan.—Mr. BUCKLE had not been previously aware that the plan had been tried, but he had ascertained that uniformity of the discharge was greater than that of the blowing cylinder, and the quality of the iron would be better.

Mr. HENKINS said, that in the works in Scotland with which he was connected they had a fan so badly constructed that they were about to have it altered, which, nevertheless, turned out 200 to 220 tons of casting per week. They had found that they could get something like double indicated power out of the ordinary Fairbairn's engine, compared with what it was sold for. He should like to know the proper form of the fan, the proper length of pipe, and the size of the pipe which conducted the blast from the fan to the place where they intended to use it. In Scotland they were working a shaft 200 ft. long; and he should like to know whether they could effect their object by laying down underground piping instead of having a shaft to conduct the power to near the place where they wished to use it. They had enlarged the tuyere pipe, having ascertained that, in melting iron, the density of the air was not so important as the quantity, and that it was necessary that the air should be admitted in large quantities.—Alderman GEACH knew of one furnace where the cupola was 150 ft. from the blast.—Mr. H. SMITH stated some experiments, which went to show, as the Chairman remarked, that putting the case in an extreme point of view, the further the blast was from the fire the better. The discussion was then adjourned to afford an opportunity for further experiments.

The next paper was from Mr. J. WILKINSON, who, the CHAIRMAN observed, had been bold as to try a totally new plan for economising fuel, by introducing heated air into the boiler of a steam-engine, among the steam, by which the inventor estimated that he effected a saving of 20 to 25 per cent. in fuel. They had had steam and heated air separately, but this was the first attempt to combine them. The following are extracts from the paper.

"It is an unalterable law of Nature that to produce a given quantity of steam, a given quantity of heat must be imparted to the water, and that in proportion to the steam required. Therefore, under the most advantageous circumstances, to produce an effect, a certain amount of combustion must necessarily be expended. Now I find, from repeated experiments, that water alone is not the most economic agent to work with; and, by way of elucidating this fact, I will explain one, and only one, though not the most successful of my experiments, and this was made on a six-horse power high-pressure engine. The principle consists in the injection of a stream of air, heated to the high temperature of 800, into the steam in the boiler; by which means the temperature, and, consequently, the expansive force of the steam was increased. To effect this object, an iron pipe or tube was cut in a serpentine form, so as to present a great extent of surface, and placed under the boiler, there to receive a red heat from the glowing part of the fire, after it had passed the bridge on its course to the fire. One end of this rarefying chamber was connected with an iron air-pump, proportioned to the size of the cylinder of the engine. The other end was inserted by a continuation of the tube above the surface of the water into the steam in the boiler. The whole capacity of the tube was greater than the volume of compressed air which it received from each stroke of the piston of the pump, so that the air did not enter the boiler until it had acquired the full heat or nearly so of the red-hot tube through which it passed. At every stroke of the piston the same quantity of cold air was injected into the tube. That part of the air which was next to the pump was forced into a hotter place, and the air, which previously occupied that hotter place, was forced on to a still hotter one, and so on, until the further hottest of all was discharged into the steam in the boiler. The pressure of air in the tube, strictly speaking, exceeded that of the steam in the boiler, for it was an excessive pressure that overcame the resistance in the boiler. That, at the commencement of each stroke the air in the cylinder of the pump was in equilibrium with the external air, and only overcame a resistance as it became compressed, and gradually increased its compressed force until it arrived at its maximum, which was the point of equilibrium with the compressed air in the hot tube and the resistance of the steam. Taking all things into account, the whole amount of power expended in working the pump was about 5 per cent., or 150th of the force which acted on the steam cylinder of the engine, and the result of the experiment showed that the application of the heated air caused a reduction in the quantity of coal consumed of from 25 to 30 per cent., and this was continued for several weeks, the engine of course working at its usual pressure."

The CHAIRMAN had had his attention called to the invention by Mr. R. STEPHENSON, who wished him to try it in the locomotives on the line, but he had preferred to wait till he had ascertained whether the principle was economical, and whether the results could be depended on with a stationary engine.—Mr. COOPER had seen the invention tried, and observed that the engine worked slower with than without it; but, as the inventor of the invention had put it out of order, he would not express any opinion upon the value of the subject postponed.

The next paper read, was one on the Improvement of Railway-carriage Breaks, which, with the interesting discussion thereon, will appear in next week's Journal.]

CONSOLIDATED MINES.—The usual two-monthly meeting of adventurers was held at the account-house, on Wednesday last, when the accounts, of which the following is an abstract, were allowed, and a dividend of 10/- per share declared:—By balance at last account, 1877L 16s. 1d.; ores sold, less dues, 10,782L 3s.—12,665L 19s. 1d.—To costs and merchants' bills for March and April, 9560L 3s. 1d.; dividend of 10/- per share, 1000L—10,560L 3s. 1d.; leaving balance in favour of the adventurers of 2105L 16s.

SILVER-LEAD ORE.—Computed about 100 tons of silver-lead ores from the East Tamar Mines, arrived in the River Thames during the past week, consigned to Mullins, Brothers, and Co., and is now being delivered.

INTERESTING GEOLOGICAL DISCOVERY.—Last week there was obtained from the Bishopsmill Quarry, worked by Mr. LAMB, in the yellow section of the old red sandstone, a cast or impression of the trunk, divested of the head and tail, of the fossil fish, Holopeltis Nobilissimus, which promises to throw some light on the normal shape of that organism. Hitherto with no other guide than the fine specimen obtained by Mr. Noble, of St. Malo, geologists had concluded that the form had been elliptical, and broadly expanded, in the manner of flat fishes. This would now appear to have been the effect of compression, for the specimen just recovered, which is in reality the trunk of the fish, studded with sand and fuller's earth, so as to maintain the exact dimensions and contour of the body, gives instead of a compressed, a thick triangular section; and, in place of a wide spindle-shaped outline, a finely tapering one, which is very striking, from the imbricated arrangement of the scale impressions, and the complete relief of the fossil, rising out of the surface of the slab, as if it had been placed upon by the hand. This new aspect leads back to the surmise that this fish is an extinct species of the genus *Acipenser*, or sturgeon.—*Elgin Courant.*

CONSOLIDATED EXPLOSION AT BESWELL.—In another column we have recorded the explosion which took place at Messrs. HARDING and CO.'s New Hall Colliery, near Leeds, which resulted in the death of nine human beings. The adjourned inquest was held on Thursday, when, from the evidence of Mr. E. BOOTH, of Wakefield, coal viewer, and others, and, indeed, by the admission of Mr. HARDING and his own men—it appeared that the explosion was owing to bad ventilation, and the immense extent of old workings in the pit. The spot where the bodies were found was 500 yards from the shaft, and it appeared the lamps would not burn well, the air being so impure. Mr. BOOTH recommended two currents of air, instead of one—which suggestion the owners ordered their under steward to carry into effect. The jury returned the following verdict:—"Accidental Death," and they desire to accompany their verdict with a strong recommendation to Messrs. HARDING immediately to adopt the alteration proposed by Mr. BOOTH, and by which they are of opinion, the circulation of air will be greatly improved, and the mine rendered safe for the men to work in. And the jury also think, that the furnace should be attended to, day and night, and more particularly on Sunday nights.

Mr. BUCKLE said, that he had found that the area of the discharge and the density of the air, corresponded very nearly. His object had been to show the quantity of the air discharged at a certain density, and the power it required to effect that result.

The SECRETARY read another paper which had been received on the same subject, from Mr. JONES, of the Bridgwater Foundry, Bridgwater; the sending of which had been suggested by his seeing the subject named in the advertisement of the meeting. The following is from Mr. JONES's paper:—

"These are, perhaps, no points upon which mechanics have had a greater variety of opinion than that of the application of the fan for manufacturing and other purposes; nor is there any other subject which has caused more disappointment; and I am decidedly of opinion that this has been principally occasioned by constructing the air passages too small in the fans, as well as the passages leading to the tuyeres. Facts are always better than opinions; and in offering the following statement, I merely give the result of six months' constant work. Two points of importance in the construction of fans are, an exact balance of the fan upon the axle, and a careful and judicious arrangement for getting up the speed so as to avoid either tight straps, or any slipping up on the pulleys. With this I forward you a drawing of the fans I have constructed. You will perceive that I have made the openings unusually large, but the results have fully justified the proportions. With these two fans we have been melting 50 to 60 tons of iron per day, at the rate of 5 to 6 tons per hour, with a consumption of 200 lbs. to the ton of iron; in addition to which there are upwards of 50 smiths' fires blown at the same time. The power required is about eight horses, the motion being taken from a 12-horse power engine by means of a 7 in. guita percha belt, the shaft running at 73 revolutions per minute. The speed of the fan is about 750. They are driven by a pulley on each end of the spindle. This I think much better than a single strap. The openings at the side of the fans are 2 ft. 4 in. in diameter, and the outlets are 24 in. by 12 in. The passage from the fan is 2 min. 9 sec. by 1 min. 9 sec., leading to a reservoir under the cupola 18 min. 0 sec. by 7 min. 0 sec., by 4 min. 0 sec. deep, from which we have two tuyeres 6 in. in diameter. The pressure of blast is about 5½ cwt. per inch. The only thing to which I wish to call your attention is the increased size of the air passages; and when we consider the large quantity of iron melted, and the small proportion of coke used, the result is very satisfactory."

Mr. BUCKLE remarked, that his paper had been drawn up for the purpose of recording a course of experiments made during a series of years at his mine, and which had been recorded with the utmost care. The results were important to those who were about to adopt him, as teaching them that his size must not be a matter of guess-work. "When he never had a fan made, all the advice he could get was, 'Make it big enough.' The persons who used to know nothing about it. Had he been then in possession of the results

BRITISH MINING OFFICES,

41, MOORGATE-STREET, LONDON.

Current Prices of Stocks, Shares, & Metals.

STOCK EXCHANGE, Saturday morning, Eleven o'clock.

Bank Stock, 7 per Cent., 189 91	Belgian Bonds, 4½ per Cent., 91
3 per Cent. Reduced Ann., 85 4 1	Dutch, 3½ per Cent., 57 8
3 per Cent. Consols Ann., 86 7	Brazilian, 5 per Cent., 83
3 per Cent. Annuities, —	Chilian, 3 per Cent., 52 4
24 per Cent. Ann., 87 7	Mexican, 5 per Cent., 20
Long Annuities, 82	Spanish, 5 per Cent., —
India Stock, 10½ per Cent., 242	Ditto 3 per Cent., 33 5
3 per Cent. Consols for Acc., 86 4 7	Portuguese, 5 per Cent., 82
Exchequer Bills, 10000. 2d., 1 pm.	Russian, 5 per Cent., —

MINES.—The mining share market has been very dull for the past few weeks—but if we may augur any improvement from the business transacted this week above the preceding one, we may certainly venture to anticipate a more lively market shortly; for it is obvious, from the inquiries made after shares in different mines, that some business is contemplated, although the prices offered do not reach to the quotations or limits given.

Stirrups find buyers at something less than last week's quotations; the report received this week is highly satisfactory.

Cordwainers have been in demand, and a few transactions have taken place, at an advance. Several shares in Treleigh Consols have changed hands during the week, and buyers are still to be found. In Treleigh, Mary Ann, and Trehane, some few shares have found their way into other hands. At the meeting of the former mine, held this week, some alteration in the management is likely to take place—when effected, the shares will, it is expected, realise their value.

There does not appear to be much doing in the county—indeed, all our correspondents are representing the distressing state of the mining population, arising from the high price of provisions. This would be a most fitting opportunity for the monopoly of smelters to show that they can assist those by whom they are benefited, by raising the standard in proportion to the price they obtain for fine copper.

In the foreign market there has been transactions in Bolanos, Australian, Kinzithal, and Asturians, during the week; and buyers in Australian are readily found, at a little less than our present quotations.

RAILWAYS.—The share market continued during the present week in the same dull unvarying position as during the past; little or no business was done, and a very general tendency to increased depression exhibited itself—this state of things continued, with little intermission, up to yesterday.

MEETINGS.—GLASGOW, AIRDRIE, AND MONKLAND: special meeting, to consider transfer to the Edinburgh and Glasgow Company; confirmed.—CORK, BLACKROCK, AND PASSAGE: half-yearly; in consequence of alteration in the plans, contracts had been let much below the original estimate; from the accounts, it appeared, that the receipts had been 20,246L; expenditure, 9267L.—KILLARNEY JUNCTION: half-yearly meeting; it appeared, that since the last general meeting, 16 miles of the line had been purchased, through the good feeling of the landowners; and, that, in consequence, the works would be immediately commenced; there had been expended since May, 1845, 12,976L: leaving a balance of 19,509L.—WISHLAW AND COLYNESS: special; to sanction the transfer to the Caledonian Company; adjourned to the 7th of June.—WILSONTOWN AND MORNINGSIDE: special; decided by 182 to 107 not to sell the line to the Caledonian.—EDINBURGH AND BATHSGATE: to consider propriety of reducing directors to five; adjourned to June 16.—Other meetings appear under the head "Public Companies."

HULL, THURSDAY.—The causes exercising a depressive influence over the share market, having unfortunately continued in full operation throughout the past week, we need hardly mention that no improvement has been experienced, either in light or heavy stocks; so long as Exchequer bills, paying 4½ per cent. are quoted at a discount, and wheat commands upwards of 5L per quarter, it is vain to look for an altered state of things; at the same time, those who buy shares now to hold for investment can scarcely do wrong, unless the selection be very injudicious.

LATEST CURRENT PRICES OF METALS.

LONDON, MAY 21, 1847.

	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
IIRON—Bar & Wales—ton	0 0—8 10 0	COPPER—Ordin. sheets, lb.	0 0—0 0 11		
" London	0 0—9 10 0	" bottoms	0 0—0 0 12		
Nail rods	0 0—10 10 0	YELLOW METAL SHEATHING	0 0—0 0 92		
Hoop(Staf.)	0 0—11 12 0	TIN—Com. blockag., cut.	0 0—4 12 0		
Sheet	0 0—13 10 0	" bars	0 0—4 13 0		
Bars	0 0—11 5 0	Refined	0 0—4 15 0		
Welsh cold-blast	3 4—10 5 0	Straits	0 0—4 8 0		
foundry pig	3 4—10 5 0	Banks	0 0—4 14 0		
Scotch pig, Clyde	3 5 0—3 7 6	TIN-PLATES—Ch. ICI, box	1 9—1 11 0		
Rails, average	9 0—9 5 0	" IX	1 15—1 17 0		
Russian, CCND	0 0—	Coke, IC	0 0—1 5 6		
" PSI	0 0—	" IX	0 0—1 11 6		
" Gouref	0 0—	LEAD—Sheet & c. ton	0 0—19 10 0		
" Archangel	0 0—13 10 0	Pig, refined	0 0—30 10 0		
Swedish iron on the spot	0 0—11 15 0	" common	0 0—18 15 0		
" Steel, fust.	0 0—16 5 0	" Spanish, in bd. 17	10 18—0 0 0		
" kegs	0 0—15 0 0	SPELTER—(Cake) on spot	0 0—21 0 0		
COPPER—Tin	0 0—97 0 0	for arrival	0 0—20 0 0		
Tough cake	0 0—98 0 0	ZINC—(Sheet) m export.	0 0—27 0 0		
Best selected	0 0 101 0	" Zinc	0 0—27 0 0		
a Discount 2½ per cent.	b Net cash.	c Discount 2½ per cent.	d Ditto		
in kgs & 4-inch.	Discount 3 per cent.	g Ditto 24 per cent.	h Net cash in bond.		
Discount 3 per cent.	Discount 24 per cent.	l Net cash in bond.	m Discount 1½ per cent.		
Discount 1½ per cent.	Discount 3 per cent.	o For home use it is 32L per ton.			

[From our Correspondent.]

IRON.—Welsh is a shade lower, but the other descriptions may be quoted precisely as last week, with no improvement in the demand.

COPPER, TIN-PLATES, LEAD, and SPELTER are steady at quotations, but business is limited.

TIN, both English and Foreign, is very dull, and prices nominal.

GLASGOW PIG-IRON TRADE, MAY 20.—We have had a very dull market in iron for the last week. There have been a few transactions during the week at 6s. 6d. to 6s. for mixed Nos., cash. Yesterday afternoon a sale was reported at 6s. 6d. to 6s. for mixed Nos., cash. Yesterday afternoon a sale was reported at 6s. 6d. to 6s. for mixed Nos.; 6s. 6d. for No. 1, cash, free-on-board.

SHIPMENTS OF PIG-IRON DURING APRIL LAST.—We give below a note of the shipments of pig-iron from the 1st of January till the 30th of April, 1846, compared with the amount shipped during the same months of the present year. The overplus shipped during the first four months of 1847, appears to be only 3000 tons; but it must be kept in remembrance, that at Kinnel, Borrowstounness, Charleton, Ardrossan, and Ayr (ports from which, previous to 1847, the exports were but small, and, in some instances, a mere nothing), where new furnaces have only been in operation since the latter end of last year—that from these ports the shipments from Jan. till April 30, this year, have not been under 20,000 tons, and which are not taken into account in the statements given:—

Pig-iron shipped during April last:—

From the Broomielaw Tons 17,934

From Port-Dundas and Kirkintilloch 13,909—31,843

Shipments of pig-iron from 1st Jan., 1846, compared with the same month of 1847—

1846. 1847.

From the Broomielaw Tons 41,980 Tons 54,495

From Port-Dundas and Kirkintilloch 51,539 41,715

Total Tons 93,319 96,210

Showing an increase of exports, in 1847, of 2891 tons.

RAILWAY TRAFFIC RETURNS.

From these returns, it will be seen, that the amount of traffic for the last week, on nearly 2700 miles of railway, was 164,3500L, thus accounted for 86,988L for the conveyance of passengers only, 42,009L for the carriage of goods, and a remainder of 35,353L for passengers and goods together, not respectively apportioned; being an increase over the corresponding week of last year of 17,707L, when the mileage was about 1,990.

Name of Railway. Lngt. Present ac- Last Traffic Returns. 1847 1846

Name of Railway.	Lngt.	Present ac- tual cost.	Last Div.	Traffic Returns.	1847	1846
Arbroath and Forfar	15	£142,900	3 p.c.	£233 0 0	£248	
Chester and Birkenhead	15	658,293	2½	697 0 0	731	
Dublin and Drogheda	35	689,248	3½	722 5 1	831	
Dublin and Kingstown	6	347,736	9	819 0 0	982	
Dundee and Arbroath	16½	156,323	6	316 18 11	269	
East Lancashire	28	814,417	—	721 0 0	731	
Eastern Counties	17	227,553	—	586 0 0	587	
Edinburgh and Glasgow	46	2,113,326	7	10832 8 5	8574	
Glasgow, Paisley, and Ayr	53	1,867,281	7	2071 0 0	2718	
Glasgow, Paisley, & Greenock	22	835,918	2	1124 0 0	960	
Great Southern and Western	56½	1,843,718	—	1551 6 7	—	
Great Western	241	9,714,980	8	19261 16 1	19651	
Ipswich and Bury	262	303,768	—	520 0 4	524	
London and North Western	378	18,042,004	10	42120 10 0	40333	
London and Blackwall	4	1,162,717	1½	1131 18 6	1106	
London, Brighton, & South Coast	112	5,166,667	7	7412 16 7	4539	
London, and South-Western	127	4,275,789	9	7962 19 5	5792	
Manchester, & Leeds	117½	6,036,391	5½	8315 17 5	6087	
Manchester, Sheffield, & Lincolnshire	49½	1,678,108	5	1527 3 2	1704	
Midland Company	329½	7,862,274	7	20107 8 2	16342	
Newcastle and Berwick	9	1,184,079	5	884 5 10	—	
Newcastle and Carlisle	65	1,184,060	5	2386 11 8	1958	
Norfolk	70	1,195,689	7	1780 3 2	1232	
North British	72½	1,459,308	—	1086 4 10	6359	
Preston and Wyre	30	432,014	2½	630 1 11	685	
Shrewsbury and Cheshire	15	354,945	—	467 18 1	—	
South Devon	20	1,061,283	5	613 5 6	—	
South-Eastern	148½	5,885,411	3½	7630 19 3	7102	
Taff Vale	30½	888,411	6½	1481 10 11	1284	
Ulster	25	358,353	5½	868 13 1	603	
York and Newcastle	163½	1,712,317	9	9461 6 5	6659	
York and North Midland	162½	2,483,956	10	6971 0 1	4945	

RAILWAYS.—Mr. Strutt's bill, for regulating the proceedings of the Commissioners of Railways, and for amending the law relating to railways, was read a first time in the House of Commons last night.

PRICES OF MINING SHARES.

BRITISH MINES.			BRITISH MINES—continued.		
Shares.	Company.	Paid.	Shares.	Company.	Paid.
1000	Abergwesin	7	12	South Trelewney	15½
512	Albert Consols	1	2½	South Yealand	16½
1034	Alfred Consols	4½	35	South Wheal Bassett	110
235	Andrew and Nangiles	28	16	South Wh. Francis	150
10000	Ayrshire Iron Company	2½</			

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.—The next MEETING will be HELD at OXFORD, and will commence on WEDNESDAY, the 22d of JUNE, 1847.
JOHN TAYLOR, F.R.S., General Treasurer,
3, Duke-street, Adelphi, London.

VALUABLE TIN-PLATE WORKS, KIDWELLY, NEAR CARMARTHEN, SOUTH WALES.

MESSRS. KIRKMAN & THORNE have received instructions from the assignees to SELL, BY PRIVATE TREATY, an important LONG LEASEHOLD ESTATE, comprising the

KIDWELLY TIN-PLATE WORKS,

together with all necessary MACHINERY and BUILDINGS; an excellent DWELLING-HOUSE and GARDEN; a foreman's and a workman's cottage, and about half an acre of meadow land—situate about one mile from the borough town of Kidwelly; also, a WHARF and STOREHOUSE, with a frontage to the River Gwendraeth, in the said town.

The whole of the above property is held on lease from the corporation of Kidwelly, for an unexpired term of 99 years, at the low ground-rent of £1. The works contain all the requisite machinery for the manufacture of about 300 boxes of tin-plate per week.

Kidwelly is situated about 2 miles from the sea, 18 miles from Swansea, and 9 miles from Carmarthen.

The estate may be viewed by cards only, which, with particulars, may be obtained on the premises; and the Mackworth Arms, Swansea; the White Lion Hotel, Bristol; the Bell Inn, Gloucester; the Castle Inns, Brecon and Neath; the Ivy Bush Inn, Carmarthen; of Messrs. Tregon, Square, Clarke, and Morris, solicitors, 29, Coleman-street; of Messrs. Crowder and Maynard, solicitors, Coleman-street; and of Messrs. Kirkman and Thorne, auctioneers, valuers, surveyors, and estate agents, 26, Nicholas-lane, Lombard-street, London.

FOR SALE—A CONDENSING STEAM-ENGINE, of 20-horse power—capable of working up to 30—just completing, by a first-rate London maker. This engine has been built to the order of a company, who now require one of a different description.—For further particulars, and order to view, apply to Messrs. Palmer and Nettleship, 4, Trafalgar-square, London.

NORTH WALES MINING COMPANY, COUNTY OF MERIONETH.

Divided into 12,500 shares, limited to £10 each, and carried out upon the Cost-book System, with a deposit of £2 10s. per share.

OFFICES, No. 2, NEW BROAD-STREET, LONDON.

Applications for shares and prospectuses to be made at the office.

W. T. GRIFFITHS, Purser.

BIRMINGHAM, WOLVERHAMPTON, AND DUDLEY RAILWAY.

SECOND CALL OF FIVE POUNDS PER SHARE—MAKING TEN POUNDS PAID.
The directors having passed a resolution, making a CALL upon the shareholders of FIVE POUNDS on each share held by them respectively—such call to be PAID ON the 1st day of June, 1847; the shareholders are hereby required to pay such call on or before the day appointed, to one of the undermentioned bankers; and, in default thereof, they will be charged with interest, at the rate of 5 per cent. per annum, from that day until the said call will be actually paid.

The Birmingham Banking Company, Birmingham.

Messrs. Attwod, Spooner, and Co.

OR AT THEIR LONDON AGENTS:

Messrs. Jones Loyd and Co., for the Birmingham Banking Company.

Messrs. Attwod, and Co., for Messrs. Attwod and Co., and at

Messrs. Moss and Co., Liverpool, for the Birmingham Banking Company.

A circular will be sent to each shareholder, which must be deposited at the bankers when the call is paid.

By order of the board of directors,

JOHN WILLIAM KIRSHAW, Secretary.

34, Bennett's-hill, Birmingham, April 26, 1847.

BORDEAUX AND CETTE RAILWAY COMPANY.

At a meeting of the shareholders, convened by the directors, in pursuance of a requisition addressed to them, held at the London Tavern, on Monday, the 17th of May, 1847.

DAVID SALOMONS, Esq., in the chair.

The following resolutions were unanimously passed:

1. That circumstances, over which the shareholders have had no control, having rendered impossible the fulfilment of the contract entered into with the French Government for the construction of this railway, and the Government having refused to accede to the request of the company for a modification of the terms, it is expedient that the undertaking be abandoned, and the affairs of the company wound up at the earliest practical moment.

2. That a committee be appointed to take the necessary steps for giving effect to this resolution, as well as for obtaining from the French Government a return of the caution money deposited, and that the expenses incurred by the committee be paid out of the fund distributable among the shareholders, to an amount not exceeding £6. per share.

3. That the directors of the company be requested to co-operate with, and assist, such committee; and that the English members of the board of directors be requested to represent, in the strongest terms, to the collective board the unanimous opinion of the English shareholders as to the absolute impossibility of carrying out the undertaking, and the consequent necessity of abandoning the concession; and that the committee be also requested to proceed to Paris, and put themselves in communication with the board, and with the French shareholders, and invite their co-operation and assistance.

4. That such committee consist of the following gentlemen:—

J. H. Attwod, Esq. John Field, Esq., Jun.

The Hon. Howe Browne William Hartnett, Esq.

Matthew Uzzell, Esq.

With power to add to their number from the French shareholders.

5. That the foregoing resolutions be advertised in the principal papers, and be sent round in a circular to the shareholders, and that a copy of them be transmitted to the seat of the company at Paris.

DAVID SALOMONS, Chairman.

It was also resolved unanimously,—That the thanks of the meeting be presented to the chairmen, for the able manner in which he presided over the business of the meeting.

Absent shareholders, who concur in the above resolutions, are requested to communicate (by letter) with Josiah Wilkinson, Esq., No. 7, Lincoln's Inn-fields, acting secretary to the committee.

By order of the directors,

D. RANKINE, Treasurer.

Caledonian Railway Office, 122, Princes-street, Edinburgh, March 26, 1847.

PARIS AND STRASBURGH RAILWAY.—SECOND INSTALMENT OF SEVENTY-FIVE FRANCS PER SHARE.

C. DEVAUX & CO. have the honour to inform the shareholders, that they will undertake the PAYMENT, in Paris, of the above CALL, due between the 15th May and the 1st June, 1847, on the following terms:—

Call of 75 frs., and a $\frac{1}{2}$ per cent. commission £2 19 0

Less interest, 2 frs. 80c., 1st July, 1847. £2 17 0

Interest, at the rate of 5 per cent. per annum, on £3 per share, must be added to payments made after the 1st June next.

88, King William-street, City, London, May 17, 1847.

This day is published, in 1 thick vol., £60, price £1 5s., boards.

THE LAW RELATING TO RAILWAYS AND RAILWAY COMPANIES; with all the Cases relating to Compensation, Mandamus, Injunctions, and other Matters, decided in the Courts of Law and Equity; including the Decisions as to the Liabilities of Promoters and Provisional Committees, and on the Responsibility of Railways to the Poor's Estate. Also, the Practice in Parliament, Standing Orders, &c. The Appendix contains all the Statutes, Forms of Notices, Warrants, Inquisitions, Awards, &c.; with Precedents of Pleadings, Decree, &c. &c.

By WILLIAM HODGES, Esq.,

Of the Inner Temple, Barrister-at-Law, Recorder of Poole.

S. Sweeny, 1, Chancery-lane.

PATENT GUTTA PERCHA DRIVING BANDS.—The GUTTA PERCHA COMPANY beg to acknowledge the extensive patronage they have already received for their PATENT BANDS, and inform their numerous friends, that having completed the erection of their new machinery, they are now prepared to execute orders without delay. THE PATENT GUTTA PERCHA BANDS are now well known to possess superior advantages—viz., great durability and strength, permanence, contractility, and uniformity of substance and thickness, by which all the irregularity of motion occasioned by piecing in leather straps is avoided.

They are not affected by fixed oils, grease, acids, alkalies, or water. The mode of joining them is extremely simple and firm. They grip their work in a remarkable manner, and can be had of any width, length, or thickness, without piecing. All orders forwarded to the company's works, Wharf-road, City-road, will receive immediate attention.—London, May 17.

W. GRANVILLE, Manager.

PATENT IMPROVEMENTS IN CHRONOMETERS, WATCHES, AND CLOCKS.—E. J. DENT, 52, Strand, and 22, Cockspur-street, watch and clock maker, BY APPOINTMENT, to the Queen and his Royal Highness Prince Albert, begs to acquaint the public, that the manufacture of his chronometers, watches, and clocks, is secured by three separate patents, respectively granted in 1836, 1840, 1842. Silver lever watches, jewelled in four holes, 6 gs. each; in gold cases, from £8 to £10 extra. Gold horizontal watches, with gold dials, from 8 gs. to 12 gs. each.

DENT'S PATENT DIPLODOSCOPE, or mirrarium instrument, is now ready for delivery.

Pamphlets containing a description and directions for its use is, each, but to customers gratis.

NEW PATENTS.

J. Martin, K. L., Allsop's-terrace, Middlesex, for improvements in apparatus and means used when draining cities, towns, and other inhabited places and land.

J. Tattersall, Cutlery, Manchester, hider-merchant, for certain improvements in "pickets" for power-looms, and also in the tools, or apparatus for manufacturing the same.

Richard Peyton, of the Bordesley Works, Birmingham, metallic bedstead manufacturer, Jonathan Harlow, of Bordesley Works, aforesaid, and Thos. Horne, of Borough of Birmingham, brassfounder, for improvements in the manufacture of bedsteads.

S. Mawson, Birmingham, registered design for buffer and railway lamp.

T. Hazelline, Brandon-lane, New North-road, Middlesex, engineer, for improvements in the construction of furnaces.—*Mechanics' Magazine*.

AN OLD ENGINE OF THE OLD SCHOOL.—There is now in full work, at the Tredegar Old Mill Iron Works, a steam-engine which was erected by Boulton and Watt, upwards of 40 years ago, and is now nearly as good as ever.

A few weeks ago it turned out, between one o'clock on a Monday morning, and eleven o'clock on the following Saturday night, no less than 566 tons

of rails, rolled and finished, and 230 tons of puddle bars—total, 800 tons.

NOTICES TO CORRESPONDENTS.

It will at all times save much trouble, and frequently considerable delay, if communications are simply directed—

To the EDITOR,
Mining Journal Office,

26, Fleet-street, London.

Also, to avoid trouble, POST-OFFICE ORDERS should always be made payable to WILLIAM SALMON MANSELL, as acting for the proprietors.

GEOLICAL SOCIETY.—The proceedings of this learned body reach us, latterly, most irregularly—they were formerly transmitted as punctually as those from the Institution of Civil Engineers; but the official, whose duty it may be to prepare the reports, has become, apparently, a most negligent person: the subject is one, however, the members should see to, as the extremely rare appearance of any notice of their Transactions must keep the society quite out of public view, and detract much from its utility and importance. The last notice we received was of a paper read on the 3d Feb. last.

A Subscribers' (Throgmorton-street).—We are unable to obtain any information respecting the Holyford Mines, county of Waterford. The meetings are held half-yearly, when the directors' report is published in our columns—beyond which, and the regular sales of ores at Swansea, the directors deem the publication of further particulars unnecessary.

A Constant Reader" (Cheatope).—We have not space in our present Number, but it shall appear next Saturday.

We regret being compelled to postpone the conclusion of the interesting series of papers on the Gold and Silver Mines of the New World, but which, with several others, will appear in our next.

We have several communications in hand—from Messrs. Paul and Co., on the National Economic Gas-Burner; from Mr. G. Shepherd, C.E., on Ventilation of Mines, with plan; from Mr. J. Walkinshaw, on Mr. Biram's Oblique Paddle-Wheels; Mr. T. Deakin; Mr. A. T. J. Martin, &c. &c.

The MINING JOURNAL is published at about Eleven o'clock on Saturday morning, at the office, 26, Fleet-street, and can be obtained, before Twelve, of all the news-agents, at the Royal Exchange, and other parts of London.

THE MINING JOURNAL
Railway and Commercial Gazette.

LONDON, MAY 22, 1847.

We have before us a document, showing the immense resources which exist in America for forwarding to this country enormous supplies of food, which, in the present state of famine, and consequent riot and crime, to which many parts of England as well as Ireland are reduced, is of a highly encouraging nature. The season is rapidly approaching when the great lakes of America will be crowded with vessels bringing to the seaboard those staples so much needed here; and in conveying to the far west those emigrants who are seeking a new home in the prairies, and enticing districts, of that fertile and yet unpopulated country. The document in question shows the immense resources America possesses for forwarding the "staff of life" through the lakes, and from thence by canals and railways, to New York, Philadelphia, Baltimore, Boston, &c. There are now probably 50 millions of quarters of the different kinds of grain used for bread, which can be spared for shipment before the crops of 1847 come to market. It is supposed also that no less than 700 millions of bushels of Indian corn alone will be raised—with which assistance, added to the English harvest approaching, there is every hope that a great reaction will take place in the food markets of this country,—and that we shall arrive at a period of prosperity, when a labourer's wages will obtain him something like a living. This great importation of American food will also, doubtless, give a great impulse to our manufactures in exchange for food, and be the means of establishing a comparative state of prosperity among all classes of the community.

By late arrivals from Auckland and Sydney, we have received an account of the proceedings before the Executive Council, which have terminated in favour of the North British Australasian Company. We look upon the decision as one of the highest importance, as discrediting favouritism and injustice, even when exercised by their Excellencies Colonial Governors. It appears that Messrs. WHITAKER and HEALE, two personal friends of Capt. FITZROY, the ex-Governor of New Zealand, and Members of the Legislative Council, had obtained a grant from him to work the copper lodes in the island of Kaw-aw, between high and low-water mark—the whole island being the sole property of the North British Australasian Company, by a previous grant from the same Governor. The present Governor had directed the Attorney-General to take steps for setting aside the grant to Messrs. WHITAKER, on the ground of illegality; we have perused the arguments employed by the learned gentleman, and are pleased to find that the Judges were unanimous in revoking and annulling the grant to them—thereby leaving the whole island the undisputed property of the North British Australasian Company.

It is melancholy to reflect on the numerous accidents that so often happen to railway bridges and viaducts, by which many fatal events have occurred, and great personal injuries sustained, involving great expense either to the contractor or his employers. It appears to us that private individuals and companies would do well to consider the several plans for bridges and viaducts constructed with wrought-iron, communicated to us from time to time by Mr. T. MOTLEY, C.E., of Bristol, as being calculated to afford greater security at a less cost. In order to enable such parties so to do, we have solicited Mr. MOTLEY to furnish us with a brief detail of his several plans, which he proposes to do in our next publication. We particularly direct their attention to Mr. MOTLEY's very ingenious plan for a bridge at Clifton, near Bristol—an engraving of which appears in another part of our paper—and we think, from the high testimonials it has received, that it, indeed, well deserves that encouragement and success which the want of patronage and the means has hitherto prevented.

We have frequently drawn attention of late to the vast increase in the demand for slate, both for home and foreign consumption, which rendered quarries of that article a very valuable property. Several undertakings have lately been brought before the public for the purpose of working slate quarries; and we have little doubt, if properly managed, they will be a source of great profit to those who embark in them.

The export trade to America has, we understand, increased considerably—while the fact, that from 70,000 to 80,000 houses are being annually built in this country, must, of itself, tend to keep up a steady demand; and last, though not least, we have a new means of consumption for slate in the uses in which it has superseded such materials as lead, zinc, &c., in the construction of cisterns and vats, and frequently marble in chimney-pieces.

The slate quarries of Wales are, perhaps, the most important, both on account of their extent, and the number of persons employed in them, as well as the quality and value of the slate. The Penrhyn Quarry, which is situated a few miles from Bangor, deserves espe-

cial notice, employing, as it does, upwards of 2000 persons, and yielding its wealthy proprietor (the Hon. Col. PENNANT) a princely annual revenue. The quality of the slate from this, as indeed from all the quarries in the neighbourhood of Bangor, is universally known and admitted, both at home and abroad. On all occasions, the Bangor slate receives a decided preference in the market. Situate between the Penrhyn Quarry, and the port of Bangor, and within a very few miles of each, is the Pantdraenio. We have lately referred to this quarry, and given some particulars respecting it, which renders it almost unnecessary to say more at present, than simply to state, that a company is formed for carrying on the workings, and we have heard will soon have about 200 men at work making slate—there being 80,000 tons uncovered, and the "plant" in readiness to commence operations. They estimate a return of 20 per cent. per annum on their capital of 40,000. Upwards of 60 vessels were lately lying at one time in the port of Bangor, waiting to load with slate from the quarries in that part of the

country—some of which had been detained there several months, and among them were a few large American vessels. This does not only apply to Bangor, but also affects other ports in Wales—such as ports Dinorwic and Madoc, in the vicinity of which are the quarries of Mr. ASHTON SMITH, as well as those in the neighbourhood of Carnarvon, the Celwyn, and others, or the Festiniog district. We may also mention the Merionethshire Slate Company, which commenced working their quarries last October, and paid a dividend of 5 per cent. upon the paid-up capital, out of the profits of the first three months. In Cornwall, there is the Combe Valley, to work which a company has lately been formed, and which progresses very satisfactorily—in proof of which, we refer to the reports which periodically appear in our Journal. Our review, brief as it is, would be incomplete if we omitted to mention, the

PROGRESS OF FRENCH MINING INDUSTRY.

[FROM OUR PARIS CORRESPONDENT.]

It may be considered almost certain that the bill for the abolition of the duties on iron for shipbuilding will not be carried this year. The committee is dawdling away its time in frivolous inquiries; the Government is not very anxious about the measure; deputies are getting tired of the session, and a universal desire exists to bring it to a close with as little delay as possible; and last, but not least, the ironmasters have put forth one, still employing their great influence against the bill. Your readers must, therefore, expect to see it laid on the shelf until this time next year—perhaps, even this time two years.

A short debate in the Chamber of Deputies yesterday, and the day before, proves the justice of the complaints I made to you some weeks ago against the scandalous system of favouritism practised in this country, with respect to contracts for coal. In 1844, the committee appointed to receive the coal destined for the Post-office packets, rejected a quantity of 50,000 kgs., as being of bad quality, and unfit for use; but, notwithstanding this, the Minister of Finance gave orders for the coal to be received, and it was received and paid for. The coal, it is observed, came from the Grand' Combe Mines; and the Grand' Combe Company is very powerful and very wealthy—so that the Minister was really delighted to do them the favour of palming off a quantity of their rubbish "of bad quality, and unfit for use," at the expense of the State. The excuse of the Minister to this grave charge was, that the coal was rejected by the Government authorities at the very instant that they were told that it was French coal; but that, as it was desirable to try the experiment whether French coal was not fit for steamers, he had ordered it to be received. You will see that this explanation explains nothing—it leaves the case exactly where it was. The Minister knew that the Grand' Combe coal was bad—he knew that the captains of the steamers protested against being compelled to use it instead of English coal—he knew that it had been rejected by those whose duty it was to examine the quality of coal supplied to the Government—and yet he gave orders that it should be accepted and paid for. If this were not favouritism, what was it? But the Minister goes on to say, that the result of the experiments that were made with this coal were so satisfactory, that the Grand' Combe coal has ever since been extensively employed in Government steamers, where previously English coal was exclusively employed. He, however, admits that many of the captains and many of the most eminent officers of the Marine Department, complain strongly of it, as inferior in every respect to English coal; and even those who are not altogether so prejudiced against it, admit that it is not so good as English coal; and that it occasions an immense deal more trouble in use. By buying its coal, and compelling the captains of the Government steamers to use it, the Government has added immensely to the profits of the Grand' Combe Company, and enabled it to pay some large debts that it owed—whilst, at the same time, it has driven so much English coal out of the market. On all these results, the Minister has the astonishing audacity to congratulate himself; but, really, after all, the thing is nothing more than this—that he has imposed a heavy burden on the national Exchequer, and compelled the Post-office packets to use bad coal, merely to oblige the Company of the Grand' Combe Coal-Pits, and to "put money in their purse."

The Company of the Mines of St. Berain and St. Leger, will hold a general assembly on the 9th of June, at Paris, to receive the report of the Committee of Liquidation. The last dividend is to be paid on and after the 21st of June next.

In addition to the legal prosecution which the inhabitants of St. Etienne have commenced against it, and to the opposition with which it is threatened in the Chamber of Deputies, the great amalgamated company, formed of the coal companies of the Loire, have to encounter the hostility of some of their own shareholders. These gentlemen object strongly to the amalgamation, and are taking legal proceedings to have it set aside. They laid their complaint before the tribunals at Lyons; the company objected that, as its head-quarters are now at Paris, the case should have been brought before the Paris courts—but the Royal Court, at Lyons, has decided that the action was properly brought at Lyons, and has accordingly ordered it to be gone into. This is a first defeat to the great company, though not, it is true, of any great importance.

The case of General Cubières, and the mines of Gouhenans, is still undergoing preliminary examination before a committee of the Chamber of Peers. If it be not buried, some very strange disclosures are expected. M. Parmantier, the shareholder of the company, who made the exposure of M. Cubières, has published a long document, to prove that Cubières did not compel the Minister of Public Works, but got shares from the company under pretence of doing so; but before deciding in our minds on this point, we must wait until the whole facts shall have been brought out by a public trial.

The Company of the Salt-Works and Coal Pits of Gouhenans, in the department of the Haute Soane, was originally formed with a capital of 6,000,000 fr., divided into 6000 shares, of 1000 fr. The concession consisted of two mines—one of coal, conceded 30th July, 1826—the other of rock salt, conceded 3d Jan., 1843—both of which are still being worked. At a late period, the company was reconstituted with the same capital; General Cubières was, for a long time, chairman of the directors.

M. Mertian, of the Iron-Works of Montataire, has been down on the unhappy *Sicile* again, and has got it condemned to pay somewhat heavy damages, for delaying to publish his ponderous epistle, in reply to the slashing attacks of M. Leon Faucher, which made so much noise some months back, and which your readers cannot have forgotten. M. Mertian is really carrying things with too high a hand. The poor *Sicile* was sufficiently punished, in being compelled to publish his prose, but to pay for it!

The profits of the mines and railway of the Grand' Combe were 1,292,266 fr. in 1845, and only 1,143,668 in 1846. The sum produced by the coal pits was 1,549,367 fr. in the former year, and 1,403,423 fr. in the latter. The falling off is said to be owing to a tremendous storm having injured the pits in September. The report of the directors for last year represents the company as in a favourable position, and says that no doubt is entertained that the extraction of coal can be carried up to 400,000 tons annually; but even that vast quantity would, according to the report, hardly meet the demand. A deficiency of miners is the principal cause of the inability of the company to add materially to its present extraction, which is about 300,000 tons. The report says, that the sales are increasing for the present year, and that "on the 1st of Jan. next it will be easy to pay the half-year's interest in arrear, or 75 fr. per share, for the year 1847; and, for the future, the payment of 50 fr. interest, and of a minimum of 25 fr. as dividend."

A dividend of 52 fr. per share is now in the course of payment for the year 1846, by the Company of the Iron-Works of the Dordogne.

The Company of the Hauts Fourneaux et Forges de Maison Neuve et Rosée, will hold a general meeting at Paris on the 25th.—Paris, Wednesday.

BELGIUM.—The first annual meeting of the "Société des Charbonnages Belges" was held at Mons a few days ago, under the presidency of the Baron James de Rothschild. The statement of the accounts was considered of a highly satisfactory character by the shareholders. It was, however, resolved that only 5 per cent. interest on the calls should be paid, so as to be able to attribute 10 per cent. as interest and dividend on the shares, the remainder of the profits being carried to the reserve fund. The company, which was constituted in May, 1846, is composed principally of French and Belgian shareholders, there being very few shares, indeed, in English hands. The report read in the name of the directors was very voluminous. It set forth in great detail the principles on which the company is founded, and on which it is to be conducted. It minutely stated the improvements that the directors have already effected. It stated that the extraction and sale of coal had greatly increased, and the pits were in a most satisfactory condition, as regards salubrity and safety. It said that the company had acquired the concessions of the coal-pits of l'Agrappe and Griseuil, of l'Escoffreux, and of the railway of St. Gélin. It set forth a mass of details relative to the extent and thickness of the coal veins, and compared with those of St. Etienne and Rive de Gier, which are the best in France, such comparison being greatly to the advantage of the company's veins. The company has, continued the report, formed a canal port at St. Gélin, entered into an arrangement with the railways of the Haut and Bas Fleur, for the development of the traffic of the St. Gélin Railway, and for concluding the interest of the respective companies. The report announced, that the company had also entered into

an arrangement for the annexation to its pits of the Charbonnages of the Grand Buisson, which, it is believed, will be found to be most advantageous to the company. Taken altogether, the report was considered highly satisfactory, and afforded great pleasure to the shareholders.

The success of this company will, no doubt, encourage French capitalists to form many others. In addition to it, they have already great numbers of shares in other companies, and every day are increasing their investments in the coal-pits and iron-works of this country. I am at a loss to understand, how it happens that Englishmen, who have advanced large sums for the formation of railways in Belgium, should have entirely overlooked coal-pits and iron-works, and should have allowed them—the safer and more profitable investment of the two—to be snapp'd up by Frenchmen?

The Company of the Charbonnages of Courcelles Nord, will hold a general meeting of the shareholders on Saturday, the 26th of June.

The Senate and the Chamber of Deputies have passed a bill for reducing the tolls on coal, cast-iron, iron, &c., conveyed on the Sambre and Meuse. The effect of the measure will, it is expected, be very favourable to the iron-works and coal mines of the provinces, through which those rivers flow.—Brussels, Tuesday.

THE COAL TRADE.—A petition has been forwarded to the House of Commons, from a number of gentlemen representing various collieries in the county of Durham, loudly complaining of the vicious system at present attending the management of our railways in the north. They state, that the several Acts of Parliament, which regulate the traffic arising from the Great Northern Coal Field, and which have been obtained in different Sessions of Parliament during the last 18 years, by private persons or public companies, at a period when railway legislation was little understood, are contradictory, uncertain, and inefficient; that the restrictions imposed by such Acts are evaded or disregarded; that many of the maximum rates of tolls and charges authorised by the several Acts are fixed so high, as to be perfectly inapplicable for the purposes designed by the Legislature; and to leave the entire control of the public interests and convenience in the hands of the railway companies, who may be said, for all practical purposes, to be perfectly irresponsible. That owing to private agreements between individuals and the companies, there are almost as many rates of charge as there are collieries; that the charges for wagons, spouts, drops, staiths, incline planes, &c., ought to be uniformly regulated by Act of Parliament. It then pray's for a revision of the whole railway tariff, and not to allow the insertion of certain clauses, to remedy the evils complained of. The petition is evidently a hit at Mr. Hudson's policy in railway management, under which the public are completely at the mercy of boards of directors.

QUICKSILVER TRADE OF SPAIN.—The Spanish *Gazette* of the 12th instant contains the terms upon which "the quicksilver produced by the mines of Almaden, Almadenejos, and others, that are now discovered, or may be discovered, in the Peninsula within five years, from the 20th of September, 1847, to the 19th of September, 1852," is to be put up to auction. The Government estimates the annual product at 20,000 quintals, and the contractors have no right to exact the furnishing of a larger quantity; but it engages to deliver over any additional quantity that may be obtained without prejudice to the mines, and also to make up any deficiency in the 20,000 quintals during the five years, by supplying the requisite amount from the successive proceeds of the mines at the conclusion of the contract; the quicksilver to be delivered at Seville as before. The contract to be bid for on the 10th of June next, in presence of the Minister, and other high finance *employés*, the directors of the Sinking Fund Board, &c. No bidding to be received unless a previous deposit has been lodged in the Bank of San Fernando of \$100,000 in money, or 6,000,000 of Three per Cent. Stock. The contractor to engage to advance 60,000,000 of reals to the Treasury—viz.: 15,000,000 within 15 days after the adjudication of the contract in gold or silver coin, and three other instalments of the same amount in silver bars, on the 25th July, 25th August, and 25th September. French five-franc pieces will, however, be received in payment of the latter. The advance to be repaid during the five years of the contract, at the rate of 12,000,000 in each year. The above is dated "Aranjuez, 19th May," and signed by Señor Salamanca, as Minister of Finance.

NORTH BRITISH AUSTRALASIAN COMPANY—KAW-AW.—The *New Zealand Journal* has the following remarks:—From Auckland, there are several items worth noticing. The first is, that the land transactions between Capt. Fitzroy and his legislative councillors, Messrs. Whitaker and Heale, have been pronounced invalid, upon the grounds that, in making the grant to these gentlemen, Capt. Fitzroy was not acting under any authority, especially relating to this transaction, but he exceeded the lawful limits of that general authority with which he was intrusted; that the "Act for the disposal of waste lands belonging to the Crown," under which he acted, had, for one of its principles, the exclusion of preference and partiality; and, apparent to the judge, "that this grant was made in manner contrary to both the letter and spirit of the Imperial Act; and that being so made, it is incumbent on the court to order the same to be revoked and annulled." This is an important decision, and will, no doubt, be brought to bear upon other favourites of the ex-governor. Mr. Whitaker has, we understand, returned home with the intention of bringing the matter before the Privy Council—the only court of appeal in such affairs. We trust he may do so; that the power of a governor to alienate colonial lands, at his will and pleasure, to those who may further his purposes, or be received into his favour, may once, and for all, be set at rest.

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SPONTANEOUS COMBUSTION OF COPPER ORE.—Our Australian papers contain some notices respecting the copper ore from the Kaw-aw Mines, in the estuary of the Thames, to the north of Auckland. The barque *Rookery*, which had shipped 170 tons of this ore as dead weight, was obliged to put into Launceston to discharge it—fears of spontaneous combustion being entertained by the captain. At the request of the agents for the vessel, the ore was examined by Dr. Pugh, who found that at 2 ft. below the surface, the thermometer rose to 150°, and a little lower to 150°. The men employed in the hold could only work for a quarter of an hour at a time, and were subject to profuse bleeding at the nose. In a letter from Dr. Pugh to the agents, communicating the result of his examination, that gentleman thus writes:—"I am perfectly satisfied, from the opportunities afforded me in the course of this inquiry, that no vessel can with propriety proceed to England with this ore as a portion of her cargo; if she reach her destination, it must be from a happy concurrence of circumstances rarely to be looked for in so lengthened a voyage. The quality of the ore makes its transmission the more difficult, containing as it does nearly a third of its weight of sulphur, exposed to decomposition from a great variety of agencies, and every change through which it may pass, giving origin to heat sufficient to prove the focus of a destructive fire." The ore was also examined by Dr. Grant, who coincided entirely in Dr. Pugh's opinion. The copper ore from New Zealand, which was being discharged at Sydney from no less than four vessels on the 18th of January, was found to possess the same qualities, and shippers were becoming afraid of it.—[Would not this dilemma be avoided by roasting the ore?—indeed, we thought the colonial miners adopted that method, to ensure its safe transit.]

COPPER MINES IN ARABIA.—A paper from Mr. Carter, was read at the Asiatic Society, "On the Copper Mines in the Island of Masseera, on the Coast of Arabia," which he had been induced to search for in consequence of receiving information that the Persians had formerly wrought copper mines in the island. He had made several attempts to find the mines, but without success; the natives denied all knowledge of their existence, and he was about to relinquish the search, when landing one morning in the month of February, 1846, on the westernmost part of the island, he accidentally fell in with some patches of blue carbonate of copper—a specimen of which was laid upon the table. Mr. Carter, now confident of success, at once proceeded to search the neighbourhood; he soon fell in with some old smelting places, and immediately after found the vein itself, with the mineral *in situ*. After describing the nature of the mine, which appears to have been little worked, Mr. Carter states that he afterwards found copper in other places; and that the inhabitants, finding concealment no longer possible, discovered to him, of their own accord, other veins and smelting places, which they said had been built by the Feringhees. Mr. Carter states, that the inhabitants, though at first fiercely opposed to the landing of the surveying party, were soon conciliated, and that the utmost good will subsequently prevailed among them during the whole time the vessel remained in the neighbourhood. They are very steady and industrious, and their habits are in decided contrast with those of the Bedouins on the main land; and he is quite satisfied that any attempts to work the mines would meet with every assistance in the power of the natives to afford.

MINING IN HUNGARY.—It is asserted in the continental papers that several French capitalists have lately directed their attention to mining industry in Hungary. The mineral products of that country are said to comprise not alone an abundance of coal, copper, iron, zinc, and lead, but also large quantities of the more precious metals. The great reason of the neglect hitherto shown in respect to the exploration of these sources of wealth is to be found, it is alleged, in the little knowledge possessed by the Hungarians themselves, both on the subject of mining and the real value of the stores contained in their native soil.

Mr. Cross's Process for obtaining pure water.—It is said that Mr. Cross has succeeded in obtaining pure water from that of the sea, by means of some process of electricity, which he has been occupied in explaining to the Admiralty.

SMELTING COPPER ORES BY ELECTRICITY.

Having published several communications on this subject, inquiring the nature of the process, and also descriptive particulars from our respected correspondent, Mr. John Mitchell, of Napier's patent, we now give the general particulars of the French invention, mentioned by "J. H." of Cornhill—that of MM. Dechand and Galter de Claubry. These gentlemen have long been engaged on the effect of weak electrical currents on copper ores; and the following is an account of the results at which they had arrived before taking out their patent. The process consists of two operations—viz.: roasting the ore, and the precipitation of the copper. The roasting is effected in a reverberatory furnace, either by the conversion of the sulphure into sulphate by the action of the air, or in the transformation of the oxide of copper into sulphate, by calcining it with sulphate of iron, at a dull red heat in a current of air—the iron being left in a state of peroxide. Washing, then extracts the sulphate of copper—so that the most impure minerals will afford copper equally pure with the carbonates or oxides. In the precipitation by galvanism, batteries would be far too costly; and they have obtained the same results without the use of exterior batteries. The principle is as follows:—If two solutions are placed over one another, one of sulphate of copper very dense, and the other sulphate of iron less dense, and in the first is placed a plate of metal, and in the second a fragment of cast-iron, and then unite these metals by a conductor, the precipitation of copper commences at once, and is completed in a long or short period, according to the temperature, the concentration of the liquids, and the extent of metallic surfaces—the state of the copper becomes greatly changed as the liquor becomes weaker. To obviate this, they take advantage of the following phenomena:—After some minutes' action, there exists four strata in the liquids; at the bottom is a dense solution of sulphate of copper, then a less dense solution of the same salt; next, a sulphate of iron, and on the surface a less dense solution of the same. If, therefore, we arrange at the level of each of these liquids suitable apertures for the addition or removal of the liquid, they can be kept at an uniform state of density, and thus the copper is always pure, and in the same physical condition.

For convenience, the liquids are now arranged in vertical, instead of horizontal, layers; they are now to be separated by a diaphragm very permeable to electricity, but not to liquids—pasteboard answers perfectly well for this, and lasts for months. The apparatus is then arranged as follows:—A chest of wood, lined with lead or some suitable mastic, contains the solution of sulphate of iron; into this chest a number of cases are plunged, made of a frame having its ends and bottoms formed of iron plates coated with lead, the sides being of pasteboard. The strong solution of sulphate of copper enters through a pipe near the bottom, and escapes in its weak state through an opening at the top, in each case is placed a sheet of leaded iron, and between each are plates of cast-iron; separate rods connect each plate with the common conductor, which is supported over the apparatus, and the copper is precipitated on both sides of the sheets of metal, the pasteboard preventing the immediate contact of the two liquids; the sulphate of iron thus floats above the sulphate of copper, and the apparatus fulfils all that is required. At a temperature of 68° Fahr., 1073 ft. of surface will receive 15,444 grs. of copper in 24 hours, perfectly pure, and immediately fit for hammering or passing through the rolling-mill. This manufacture of copper presents no difficulties, requires no refining, and gives no scoria. The patentee considers that as a metallurgical result 50 per cent. of the copper is obtained in sheets; 25 per cent. in fragments, which require fusion; and 25 per cent. of powder requiring subsequent refining. The application of galvanism to smelting appears to be reduced to the simplest form, and electrolytes on the largest scale can be obtained.

X GUN-COTTON—FURTHER EXPERIMENTS.

Copy of Letter from Mr. John Thornton, of Woodhead, addressed to Messrs. Ingram and Clarke, Liverpool, the Agents of Messrs. John Hall and Son, the Patentees of the Gun-Cotton, regarding Experiments at the Woodhead Tunnel, near Manchester:—

GENTLEMEN.—Below I beg to hand you the result of a series of experiments made on the 13th inst., with the view to test the value and utility of gun-cotton in mining operations, at the works of the above tunnel, now being carried on by G. C. Pauling, Esq., of Manchester, contractor. There were present to witness the experiments, Mr. H. C. Campbell, of Manchester; Mr. H. J. Pauling, ditto; Mr. Sharp, ditto; and Mr. S. Smith, ditto; Mr. John Hall, stead, the company's superintendent; and Mr. John Thornton, of Woodhead; with a number of foremen and officers connected with the works.

Experiment No. 1, in No. 1 cross-drift, at west end of tunnel, the hole 9 ft. 6 in. deep, in hard millstone grit, with a charge of 10 ozs. of cotton, did more execution than any quantity of powder would have under the same circumstances.

Experiment No. 2, in the same place and strata, the hole 3 ft. 3 in. deep, with 8 ozs. of cotton, did the same execution that is generally done with 3 lbs. of powder—moved about 24 tons.

Experiment No. 3, in open face, at west end of tunnel, in the millstone grit, 4 ft. 4 in. deep, 4 ft. from face, with a charge of 4 lbs. of powder, moved 28 tons.

Experiment No. 4, in the same face, with 8 ozs. of cotton, moved 28 tons; but did not throw it about in the same manner that powder does.

Experiment No. 5, in the same face, with 8 ozs. of cotton, moved a great space, but did not break it up—charge appeared too small, 6 ft. from face, and 5 ft. deep.

Experiment No. 6, in the same face, with a charge of 3 lbs. of powder, 6 ft. from face, and 5 ft. deep, the result was the same as in the former experiment—the charge appeared too weak.

Experiment No. 7, in cross-drift No. 15, in hard dark shale, a charge of 8 ozs. of cotton, 3 ft. deep, did the same execution that is usually done with 3 lbs. of powder.

Experiment No. 8, in open face, at east entrance of tunnel, a charge of 8 ozs. of cotton, 4 ft. 6 in. from face, in beds of hard sandstone rock and shale alternating, the charge placed 5 ft. 6 in. deep—moved about 14 tons.

Original Correspondence.

HYPOTHESES ON IRON.

SIR.—I do not see that Mr. Mushet's remarks, on my reasoning as to the transparency of glass, at all negative any opinion I have expressed on that matter; for if transparency be not one of the essential characteristics of a compound containing *certain* proportions of alumina, silica, and lime, and, consequently, fusible at a *certain* temperature, then all the compounds of the three substances just named ought, on fusion, to present the same amount of transparency which, it is well known, they do not—some of them forming merely an enamel on being fused. The following case is analogous:—There are two compounds of chromic acid and oxide of lead—the one named chromate, and the other dichromate, of lead; the former is made by adding an alkaline chromate to a soluble salt of lead, and falls from the solution as a bright yellow powder—it is composed of one equivalent of chromic acid and one equivalent of oxide of lead; the other compound, or dichromate of lead, is formed by acting on the chromate with a solution of potash, which separates from two equivalents of chromate of lead one equivalent of chromic acid, leaving a compound possessing the formula, two equivalents of oxide of lead and one equivalent of chromic acid—this is the dichromate of lead, and possesses a bright red colour. Will Mr. Mushet disagree with me, when I say that chromic acid and oxide of lead, united in *certain* proportions, form a compound, which, for one of its essential characteristics, is possessed of a yellow colour; and will Mr. Mushet deny that this yellow colour is dependant on the proportions in which the chromic acid and oxide of lead unite in this particular compound? for if Mr. Mushet does deny this, he must also admit that there ought to be no difference in colour between the next compound, the red dichromate and the yellow chromate, just mentioned. However, it must be admitted that there must be a difference in the colour, for the compound, dichromate of lead, formed as I have just stated, must possess, one of its essential characteristics, the red colour before referred to, for the reasons I have already given.

I much wonder Mr. Mushet should wish chemists and others to experiment on products prepared in the crucible: it seems to me that, as a practical man, he would rather wish to examine pig-iron produced in the large way, as it is its composition which is needed, and its peculiarities which we have to study, and not the composition and peculiarities of metal prepared in mere laboratory experiments. It must be perfectly evident, that the only true method of ascertaining the nature of any particular compound is, to take a portion and submit it to examination—first of all, by certain fixed and definite rules, ascertaining the nature of the various substances of which it is composed; and, finally, by equally fixed and definite rules, separating those substances, and estimating their several amounts, and not by attempting to make a compound similar to it, and then examining that, saying that the composition so adduced is the same as that possessed by the model, or original substance; and yet Mr. Mushet recommends such a line of research, for he says—“Were experiments made upon true white and grey cast-irons, carefully prepared in the crucible, the fact that grey-iron contains more carbon than white-iron would be clearly established; but while common pig-iron is operated upon, nothing satisfactory can be determined on this subject.” So that, in Mr. Mushet's view, chemists, and other persons wishing to examine the changes taking place in the blast furnace, should not examine the products of the blast furnace, but must manufacture substances as nearly as possible like those products, and then commence their examination.

As to the comparative amounts of carbon in grey and white-iron, my last communication will, I think, be sufficiently explanatory. Mr. M. forgets that the grey-iron does not contain all its carbon in the same state as that substance exists in white-iron. Mr. Mushet states that—“The most simple proof that more carbon exists in grey-iron than in white is the following:—Take a given piece of white-iron, and cement it in charcoal for a time—its weight is augmented, and it has become grey-iron.” Now, we will see what Mr. Mushet said on this subject, in his communication of last week—“Drs. Ure and Karsten are great and expert chemists, yet they both fall into the most puerile errors in treating of iron, such as making grey-iron out of white, by fusing the latter in a black-lead crucible.” Is it not rather extraordinary that, on May 4, Mr. M. should deny, and charge as puerile, the conversion of white into grey-iron, by fusing the former in contact with carbon, as in a black-lead crucible; and yet, on the 10th of the same month, grounds his chief argument on the very conversion he seven days before entirely and completely scouted. In many experiments I have made, I have repeatedly converted white-iron into grey by fusion and cementation, in contact with charcoal, and the weight of the grey-iron produced is invariably less than that of the white-iron producing it. In Mr. Mushet's experiments, as he has found it to exceed the producing iron, I can only explain it by supposing that he weighed the button as it came from the crucible, without removing the crystalline graphite which is always adhering to its surface when the conversion has been perfect; if this is not removed, the weight is always more than that of the white-iron employed—it must be evident to all, that such a mode of conducting an examination cannot be expected to give true results.

The following are the numbers I have obtained in two experiments on the conversion of white into grey-iron by fusion, in contact with carbonaceous matter:—Experiment 1st. 148.3 grs. of white-iron were exposed to the fusing point in contact with charcoal for three hours, at the expiration of which time the crucible was removed from the furnace, and allowed to cool; when cold the crucible was broken, and the button of metal was found covered with crystalline scales of graphite; when these were removed, it weighed 147.7 grs.—the 148.3 grs. had lost, therefore, 6 of a gr. = 404 per cent. Experiment 2d. 196 grs. of the same white-iron, treated in the same manner, gave 195.2 grs. of grey-iron—having, therefore, lost 6 of a gr. = 408 per cent. It is, therefore, quite evident, from the close correspondence in these two experiments, that white-iron, in its conversion into grey, does lose in weight, which loss must be assumed to be carbon, and that the same white-iron, placed under the same circumstances, loses a nearly as possible the same amount—thus proving the circumstancs of the experiments. I pointed out in my last a contradiction of an equally perverse character to that to which I have just alluded, and, on reference, I find another in the same communication, which I had overlooked—Mr. Mushet says—“Carbon cannot alone deprive an oxide of iron of all its oxygen” (this I replied to last week); yet, in the very same communication, in the course of a few dozen lines, he says—“Carbon, as I before stated, deoxidizes all the metallic bases at various temperatures.” I shall be much gratified by the resolution of all these difficulties and discrepancies.

Hawley-road, May 17.

JOHN MITCHELL.

SMELTING COPPER ORES BY ELECTRICITY.

SIR.—I beg to inform Mr. Howson, that the date of the patent I referred to is October 22, 1844. I was aware of the nature of the patent of Jan., 1847; and I therefore concluded, as no mention is made of any electrical arrangement, that it could not be the patent alluded to by your correspondents.—JOHN MITCHELL: Hawley-road, May 17.

HYPOTHESES ON IRON.

SIR.—I perceive “Ferreus” has a happy facility of twisting and perverting plain and simple statements, which, as he confesses, he does not understand. Can he point out any remark of mine, to the effect that *lime* is more necessary than carbon to deoxidize ores of iron? or can he point out another remark, to the effect that grey-iron cannot be produced without the agency of lime? Cannot this writer take my remarks as they really stand, and disprove them, if he is able, by argument, not by perversions? I affirmed that carbon could not wholly deoxidize an ore of iron; and that, without the agency of lime, nothing but a dull, sluggish (not sluggish) quality of cast-iron could be obtained; and yet this learned gentleman distorts the latter assertion, to mean that grey-iron cannot be produced without lime. I see, however, that the scientific bantling has unconsciously, this week, broken his leading strings, and flatly contradicts his father in science, Mr. Mitchell, who confirms my statement—viz.: “That good metal cannot be made without the use of lime.” The phantom of peroxides of calcium will not be pleased to cease to exist, whether I permit it to do so, or the reverse. I have never seen any blast furnace supplied with materials devoid of silica; but I have seen furnaces in such a state that very little silicate of iron was formed; and I have seen cast-iron made from materials in which not a particle of silica existed, yet without lime the iron was dull and sluggish, even though grey.

As neither “Ferreus,” nor Mr. Mitchell, appear to understand what white-iron really is, I shall endeavour to define it. White-iron is a defi-

nite compound of pure iron and carbon—iron 97.26 + carbon 2.74—and it is produced when pure oxide of iron is first deoxidized, and then saturated with the vapour of carbon; after the point of saturation is attained, a carburet is produced, and the iron becomes a compound of white-iron and grey, or carburetted iron. White pig-iron is a mere indefinite term for alloys of grey-iron, white-iron, steel, and malleable iron, which presents a white fracture when broken, but whose proportions and qualities are as various as those of grey pig-iron. Finers' metal approaches very nearly to true white iron, because in the finery the alloyed carbon is all, or nearly all, dissipated; whilst the combined carbon remains. True, white-iron contains no carburet; but common white pig-iron usually contains a portion of carburet, especially when the blast furnace is heavily, but not over heavily, burdened. I do not consider it any contradiction to say, that carburet of iron is not found in true white-iron, and yet exists in the common white pig-iron, because the latter is a compound alloy, containing grey-iron, more or less. When white-iron is melted in a crucible, and afterwards cemented, for a sufficient time, it becomes grey; but the melting has not any effect in bringing about this change, and, without ever being melted, it will become grey by cementation. When it is melted it loses weight; but when it is cemented, without melting, it gains weight. All iron loses weight in melting, and, in fact, by repeatedly melting the same piece of iron, it will diminish, and at length disappear; but this is not because it loses carbon, but because the iron sublimes. Let any chemist analyse a portion of white pig-iron, and ascertain its per centage of carbon—say, 3 per cent.; let him give me a fragment of this white-iron, and I can return him the fragment unaltered in its figure, but grey in its texture, and containing 4 per cent. of carbon, or more.

It is evident, from Mr. Mitchell's remarks upon silicate of iron + lime, and silicate of lime + oxide of iron, that he is not well acquainted with the nature of the bulk of ironstones, and ores of iron, in use for manufacturing pig-iron; nor can he, or “Ferreus,” answer my question in the *Mining Journal* of the 8th May. Scarcely any ores of iron in use are silicates of iron when introduced into the furnace; and, if by a premature fusion they afterwards become silicates of iron, they pass into the hearth as black cinder, or silicate of iron. In all ores of iron, and in all silicates of iron, the iron is metallised before it enters into fusion, and, where this is not the case, the fusion produces merely black glass of iron. A lump of calcareous ore descends into the hearth of the furnace; and, if withdrawn in a condition of incipient fusion, the iron will be found interspersed throughout the mass in metallic veins, corresponding to the veins of oxide which existed in the ore. The state of these metallic veins will be coincident with that of the pig-iron which the furnace is making, the iron constituting them being grey, white, steel-grained, or malleable, according to the degree of cementation to which the lump has been exposed; and, when the lump is of large size, all these kinds of iron are found, the grey outside, the white next, and the steel-grained and malleable innermost. When the furnace is making No. 1 iron, nearly all the lumps will be found to contain highly-carbonated veins of iron; when, on the other hand, the pig-iron is white, the lumps will be found to contain nearly all white, or steel-grained iron. When the furnace is scouring and the cinder black, the veins of oxide are only metallised externally; whilst the interior of the lumps contains protoxide of iron, and sometimes, in extreme cases, the original peroxide of iron. The same phenomena present themselves with argillaceous and siliceous ores of iron, as also with hematitic ores, and sparry carbonates of iron. The theory of the lime displacing the oxide of iron and taking its place, to form silicate of lime, is absurd; for the iron is in all cases metallic before fusion commences, where any iron is produced at all; and, where only oxide of iron exists on entering into fusion, nothing but a black silicate of iron and lime will result.

Whatever effect may be produced by silica, lime, and alumina, upon the iron, must take place after the iron sinks into the bath of melted matter in the hearth. Were the oxides of iron to enter into fusion, and lose their oxygen, and imbibe carbon during fusion, the action of lime might be accounted for, as Mr. Mitchell has described; but, unless oxide of iron is converted into grey iron, before it enters into fusion in the blast-furnace, it can never yield grey pig-iron by fusion. In a well-constructed and properly-burdened furnace, there is scarcely any action upon the sides; and it is only when scaffoldings take place, and change the central direction of the heat, that the sides are destroyed; and as soon as any considerable quantity of oxide of iron is melted, it will at once find its way into the hearth, and flow out as black cinder. If a blast-furnace were in perfect order, not a particle of oxide would be fused; and the nearer that it can be kept to this state, the richer will be the iron, and the longer will the hearth and sides of the furnace endure; and to approximate to this state for a constancy, the furnace must have height, to give time and heat, to afford facility for the metallisation of the largest masses; and, therefore, *a fortiori*, of the rest of the ore. It is, however, impossible that all the ore can be perfectly matured, because the heat is less towards the sides than at the centre of the furnace—therefore, at all times some portions of oxide are fused; and, passing into the hearth, they are, if in small quantity, deoxidized by the lime, and carbonated at the expense of the melted grey iron in the hearth—in short, they undergo their cementation in the hearth—the oxide being diffused in a liquid state throughout the cinder, and, therefore, in intimate contact with the lime. Should the quantity of fused oxide be considerable, the lime cannot affect the deoxidation of the whole of it, and it will flow out, discolouring the cinder.

Mr. Mitchell says, that grey iron, fused in an air-furnace, loses carbon; and the resulting metal *appears* similar in every respect to the ordinary white iron of the blast-furnace, and, in fact, it is so. Can he possibly mean that finers' metal is similar in quality to white pig-iron? It is true, that a finery, worked by a blast, can hardly be termed an air-furnace; yet, Mr. M. remarks, that the “other case” cited by “Ferreus”—viz.: that relating to the refinery—can be explained in a manner similar to the first case of the foundry air-furnace.

It appears to me, that Mr. Mitchell contradicts himself; for, setting out with the assertion, that white iron contains more carbon than grey, he afterwards remarks as follows:—“Grey iron, by fusion, in an air-furnace, becomes converted into white. Now, if the per centage of carbon in the grey iron had been ascertained, it would be found that the per centage in the white iron produced would be less.” This is a plain and palpable admission, that grey iron contains a greater per centage of carbon than its corresponding white iron; and this is all I contend for. Some white irons contain more carbon than some grey irons; but, wherever this is the case, the white iron in question can be made grey, and its weight can be increased by absorption of carbon—so that, in its state of greyness, it shall contain a greater per centage of carbon than when white—whilst the grey iron in question may be made to lose a portion of carbon, and become white, so as to contain a lesser per centage of carbon in its state of whiteness than it possessed whilst grey.

The phenomenon of a blast-furnace, as cited by “Ferreus,” producing nothing but white iron, though the cinder was perfectly grey, admits of the following explanation:—The greater proportion of the ore made use of were, no doubt, calcareous; and, like all calcareous ores, hard, massive, and refractory in the fire. There was heat enough to revive every particle of iron in the ore by the deoxidation of the major part of the oxide by carbon; and of the residue, or most refractory portion of oxide, by the protoxide of lime in close contact, and intimately mixed, with the oxide of iron in the ore. The heat, however, was insufficient; and, perhaps, the time of descent was also inadequate, to admit of the carbonation of the iron in any of the materials, beyond the state of white iron or steel; and, in other portions of the materials, the iron was not carbonated at all, but simply revived, as malleable iron—hence, when these materials were fused, a pig-iron was produced; white, because the carbonation of the materials had not been matured, similar to No. 1 iron in appearance, because every portion of oxide had been revived by the lime, and admitting of being filed and cut with a chisel, because it contained a large alloy of pure or malleable iron. Let now “Ferreus” explain my anomalous case of a blast-furnace making rich grey iron, with a black and scouring cinder; and, meanwhile, let me assure him, that whether it be important, or unimportant, either to him or to the public at large, that they should *not believe* that my erudities are sanctioned by my father; yet he not only sanctions them, but considers me fully competent to fight my own battle against “Ferreus,” or any other dabbler, who, having got hold of my father's *Papers on Iron and Steel*, and having reaped, without acknowledgment, immense pecuniary benefit from the results of my father's labours, now gets up, through your columns, a despicable attempt to throw discredit upon me; and who, whilst he pockets 10,000/- per annum by pirating my father's patented inventions, can find, in the *anale* vacuity of his intellect, no argument with which to confute the son, without having recourse to the opinions of the father, perverted and distorted to suit his purposes—I allude to “Ferreus,” and to his most impudent “N.B.” in your last week's Number; and if he finds that the cap fits him, he is heartily welcome to wear it.—ROBERT MUSHER: Coleford, May 17.

HYPOTHESES ON IRON.

SIR.—I am glad “Philo-Veritas” is relieved by finding out that I am myself, and not my father; I do not know how “Scrutator” made the mistake, if, indeed, it was his mistake, and not a mere error in the printing, of *sen. for jun.* To prevent, however, the necessity of the recent explanations being renewed, in order that my father's opinions may not be confounded with my own *inexperienced essays*, I may observe, that all the information I possess upon the subject of iron, has been derived from my father, Mr. David Musher—amplified a little, perhaps, by habits of application, and observation derived also from the same source and example. This, I think, will show that it is far from my wish to arrogate to myself any merit which is exclusively my father's, or to claim for myself a portion of his reputation as a metallurgist, by *assuming* his name as one of your correspondents has done. “Philo-Veritas” will be sorry to learn, that I have by me many MSS. volumes of experiments, or, if he prefers the designation, “strange speculations,” upon oxides of calcium, &c., &c., recorded by my father. Mr. Musher has, indeed, spent a long life in investigating the nature of iron in all its variety of forms, and for the last 15 years I have been the companion of his labours. If I know little myself, I have yet the manifest advantages of his superior ability and knowledge, of which to avail myself.—R. MUSHER: Coleford, May 17.

CAST-STEEL.

SIR.—The remarks of “An Old File,” though stamped with a degree of irony, appear yet to be made with good *temper*, and, therefore, deserve a reply. I merely observed the effects produced by forcing water into a blast-furnace in the state of steam; I had nothing whatever to do in trying the experiment—if that may be called an experiment—which was the result of folly and neglect upon the part of the gaffer, and of credulous ignorance upon the part of his master. The cold-blast from the blowing cylinder passed into a water regulator at one side, and passed out into the stove at the other side. There was too much water in the regulator, and the furnace being blown by three nose pipes, of 4½ in. diameter each; whilst the blowing cylinder was only 60 in. diameter, with a 6-ft. stroke, working, at an average, 15 strokes per minute. The depression of the water inside the regulator was only sufficient to keep it below the eduction blast-pipe, and was carried by the blast through the hot stove, and into the furnace.

I cannot tell “An Old File” how much air, or how much water, went into the furnace to produce the cast-steel; but I have got several pounds of this steel by me—and it was no rarity, for the scientific experiment went on for months before the cause was discovered; and its effects were the more or less striking, just as the quantity of water in the regulator, and the size of the nozzles, was increased, or diminished. “Gossan,” likewise, fixes the orus of this steam experiment upon me, though I have only said, that I had an opportunity of witnessing its effects. I had no share in the glory of the achievement, but had only the merit of increasing the joint ridicule of gaffer and master, for pointing out the cause of the very unaccountable disorders with which the poor furnace was, from time to time, afflicted. A very principal obstacle to the application of steam, as “Gossan” proposes, is, that the ores with which a furnace is burdened, are not in the state of a fine powder, but in lumps; and, therefore, proportionately to their size, in a state unfavourable for being acted upon chemically—chemical action being rapidly accelerated by commination, or minute subdivision. I have no doubt, however, that it would, in almost every situation, be a most economical practice to crush, or pulverise, the ore and limestone charged upon a furnace, as the power of carrying burden would, in all cases, be doubled, and even trebled, by such a preparation of the materials; and the application of steam might then be rendered sufficiently easy, so as to pervade and insinuate itself amongst the particles of ore.—ROBERT MUSHER: Coleford, May 17.

STEAM APPLIED TO A BLAST-FURNACE.

SIR.—I am indebted to “An Old File” for the suggestion of a force-pump—I was perplexed by the letter; nor will “An Old File” hint clear all difficulty. The tuyeres become exceedingly hot, yet the interior of the furnace quite cold—no blast ascending, and the hearth full of iron: the tuyeres is the *source* of the heat. Mr. R. Musher is, I think, testing your correspondent's stock of crudity. The *extraordinary* heat implies the decomposition of the elements of water—in fact, an oxy-hydrogen blast; what, then, was the *inner* power, which annihilated that enormous temperature? In your *Journal* of the 6th of March, there is an account of a furnace, where it was alleged steam, or water, had entered, but the tuyeres were *cold*, with thick iron, and the usual accompaniments. The cause assigned in that letter by the writer for these disorders appeared rational, and the alleged cause irrational; I should be glad to inquire, whether Mr. R. Musher alludes to the same occurrence?—FERREUS: May 18.

STEAM-BOILER EXPLOSIONS.

SIR.—As “X. Y. Z.” has still a little doubt as to the fact of water being pumped into the boilers, I may inform him, that the clack of the force-pump is below the level of the hot-water cistern, and the space between it and the plunger fills with water when the plunger is not pressing downwards. I have the stop-cock he mentions—it is useful in saving the packing, &c., when the boilers do not require water, and prevents any danger from the escape-valve not closing, as it should when they are being supplied. The seating of the safety-valves, and the valves themselves, are of brass; the spindles of the valves are never thought of in “coroners” inquests—they are as likely to fix as valves. Without entering into the chemistry of the subject, relative to incrustations of steam-engine boilers, did it never strike “X. Y. Z.” in using cold water for feeding his boilers, the discharged steam from the engine, took out with it the fine particles composing the sedimentary matter of incrustation; but when the steam was condensed the above is pumped back into the boilers, and then deposited on the bottom and sides. The river water, if warmed, without the steam passing through it, would act as well as the cold. I do not think any great saving of fuel is made by heating the water in high-pressure engines when a deposit is formed.—E. G.: London, May 17.

STEAM-BOILER EXPLOSIONS.

SIR.—“X. Y. Z.” in your last *Journal*, recommends a safety-valve to lessen the risk of steam-boiler explosions, arising from the common safety-valve getting fast in its seat. “The seat is to be turned to a thin edge at the rim—the valve to be a flat plate;” but he has not said how the valve is to be guided in its true position during its rise and fall. This was doubtless, an oversight, and may be given at a future time. The valve alluded to by Mr. D. Musher, would appear to me to have been the button valve, with a brass shank passing through the brass cross bar of the seat; and that, by its expansion, was liable to become fast in the same, and not at the periphery of the valve, as “X. Y. Z.” seems to suppose. Mr. D. M., therefore, recommends the substitution of iron shanks to the valves, as being possessed of a less expansive nature than brass at equal temperatures.

Coleford, May 20.

JOHN WALKINSHAW.

VENTILATION OF COLLIES—ERRATA.

SIR.—I am unwilling to trespass upon your time, by requesting you to correct a misprint, but, in justice to myself, I am compelled to do so. In my letter of the 12th inst., in the second paragraph, where I allude to the general applicability of the air as the means of ventilation, you have it, “an element in every *waited* suited to his wants;” it should be, “in every *way* suited to his wants.” Also, in the fourth paragraph, in speaking of the necessity of the moral training of the collier, you make me say “*the*,” instead of “*this*” necessity, and so on; and, also, in the fifth paragraph, in alluding to the test of experience, you have it, “allow me to ask *them*,” instead of “allow me to ask, *then*.”

I am inclined to think you have acted unfairly towards me, in suppressing two or three sentences in my letter of the 6th inst., relative to the ironical remarks on my coal machine, of a correspondent, who hesitates not to sneer at proposed improvements, however good in themselves, for working and ventilating our coal mines. I admire your remarks appended to Mr. M. Taylor's letter of

ON VENTILATING AND WORKING OF COAL MINES.

SIR.—In Mr. Storey's letter of last week he appears to think that my remarks, on the Ventilation and Working of Mines, made an attack upon his "plans in particular;" such is not the case I can assure him, as he is not the first person that has advocated, and endeavoured to reduce to practice, the application of "machinery" in the working of coal. The attempt failed after much expense, to my own knowledge; but Mr. Storey may have an improved machine, differing from the one tried in this neighbourhood, which I suppose he has, from the application of my remarks to himself; and I feel anxious that any practical improvement may have a fair trial—the coal trade in this neighbourhood requiring all the assistance that art can devise, in working the coal upon the best system at the least cost—the few words I have to offer, in reply to Mr. Storey's letter, will, I trust, be productive of good to both proprietors and the working colliers. Mr. S. refers me to Mr. Rogers's letter, in your Journal of the 8th inst., respecting which it was my previous intention to have noticed in the Journal of the 15th; but owing to other engagements, was prevented. My object in doing so was to state that, in his remarks, he ought not to have stigmatized Lancashire—thereby exposing Mr. S. to so unworthy and fallacious a reference on the subject of *Lancashire economy*, and which he "cannot admire," on account of the limited experience and information he possesses on that subject. Mr. Storey is not, perhaps, aware that the whole of the immense steam-power used in Lancashire is produced exclusively from the "small coal;" for he seems very wishful to teach us "the economy of our coal fields," by suggesting that, which has been in practice for a "great number of years; not can he be aware that this same article is valued only at 3s. per ton, instead of 7s. 6d., asserted by Mr. Rogers in his quotation of 8,000,000 tons being of 3,000,000/- value; and as to the Chesterfield district, the letter of "A Constant Reader" in last Saturday's publication, places a practical value on Mr. Rogers's letter. If every colliery, or district of collieries, were so situated, as to have such immense steam-power to supply as the Lancashire district, Mr. Rogers would have to discover a new means for "the prevention of strikes," upon which subject I feel deeply interested.

Mr. Storey next notices the adoption of any one particular plan for "working" mines, in which he agrees with my suggestions, adding only—"except by machinery." I should wish to know what kind of a machine can be constructed to meet all the variations of a mine in the course of a few yards, and at the same time retain its effective position. We are all aware that ventilation is effective in proportion to the superiority or inferiority of the "workings;" therefore, we must adopt, in my opinion, an improved mode of working, in order to give superior ventilation; and my remarks tended only to lay down a system for working, which would regulate, in a general point of view, the ventilation, which I have every reason to believe thoroughly effective. I am at a loss how to receive Mr. Storey's remarks on the qualifications requisite for a viewer, whom I contend "should not be a gentleman, but a practical, honest, sober, and industrious collier, that has worked in the mine in the same neighbourhood, who can read and write a little"—surely this is sufficiently plain for the most backward conception, and to explain which will only weaken its comprehensiveness. I am afraid he has not sufficiently studied the remark, and has been looking for some secondary impression, without receiving that which it only can convey. I mean by a "gentleman," a person having little or no experience in the underground workings, and qualified with a superior education, that prevents him from placing himself on an equality with the industrious collier. Such a man rarely spends the whole of his time in the mines, looking after personally those engaged in working, being always on the spot, and conversing with them in their own language; he is unfit for it; and prefers an occasional journey through the works, delighting more in giving theoretical instructions, than those practically demanded—such a one I call "a gentleman;" and as to the digression which Mr. S. complains of, in first proposing the qualification of a viewer to consist of "reading and writing a little," then stating that "trigonometry" is requisite, I do not propose to teach him the latter in a school or college; I would first take the viewer from the situation of a labouring collier, first knowing that he can "read and write a little;" after I had engaged him as the viewer, I would personally give him that "trigonometry" which many unacquainted with would consider the sole qualification of the school or college, but which I consider a few days' attentive labour will place within the reach of every one that is qualified with my first and principal requisites. Where, then, is to be seen the digression so apparent to Mr. Storey? or the book learning to be possessed by the viewer? It is very true the latter does not "confer talents and ability," but have I not shown you both of these, in the very choosing of the man, who as yet can only "read and write a little;" and, for the better employment of the same, I say he then ought to "be taught to dial, and lay or plot his workings." The "field" is then "cultivated" sufficiently to produce the desired "crop," and as a productive field must have a certain admixture of many requisites before it can yield to the hand of the husbandman, so must a viewer have the practice, the habits of industry, and the equality of the labouring collier, before education can make him at all capable of being intrusted with the lives of those working under him, to say nothing of the capital of his employer; yet, having those "talents and ability," education completes him for his responsible situation.

In the next place, Mr. Storey, quoting from my education, remarks, "It would be no service to try to convince the present class of miners;" and adds, "convince them of what?" I would answer, with due regard to his able remarks which follow, that it would be of no service to convince them of the necessity of such an education as I propose they should have—of the individual destruction of both life and property, which clings to their very action—of improved methods of working and ventilating the mines, in order to preserve both life and property, as they are willing to work according to the instructions of their viewer in all cases—and, lastly, that education in their children, which is the only safe pilot that they have to bequeath to a continuing and industrious community, that must be a national care when they have passed away; and why is this so? Why "have reason and argument failed?" It is because they have, as a body, reached that stage of degradation and improvidence, which will not be convinced against the experience they have gained through custom. It is because, in the recklessness of their own actions, they are unable to hold any want of care in themselves individually—so that you may assail them with what reason you like, or with the sharpest arrows of unquestionable argument, and yet you will find them enjoying the same wantonness in danger, and equally unconcerned about any fear that may arise from their own indiscretion. I have found this in the most trivial dealings; and how thoroughly does this show itself in matters of more importance. Mr. S. implies from this quotation, that the present calamities must continue until the next generation—aye, and for consecutive generations, if the whole responsibility continues to rest with the working colliers; but it is the viewer who is responsible for every thing except the care of the lamps—the system—the current of air—the accumulation of foul air—the lamps—in short, the entire management rests upon him. In those places where the viewer has only partially carried out the system I proposed, has it not been successful? Would any of those terrible catastrophes have branded coalminers generally, and the nation in particular, if that system had been acted upon? How many frightful explosions would have wanted a precedence, had merely the accumulation of foul air been absent? These, then, are not the negligence of the labouring collier, but of the system and the viewer. It is certain, that many fearful accidents have occurred through the careless venture of a naked candle; but who could say, how much this was caused by that only secondary agent? The accumulation of foul air must, in most cases, have been the first and most culpable error, and is not here traced again to the system and the viewer. Turn the matter how you will—dissect it with the most rigid scrutiny—the viewer and the system rise as the first causes: the working collier acquires a correct value of himself, his family, and dependents; a proper knowledge of his position, and the transitory part he plays in his journey through life; of the certain passage of that immortal which lies hid beneath the vile covering of his mortal nature—all these things seem in them forgotten, or, if remembered, to make them only an exception.

Mr. S. tells us the lamentable consequences of the present system; but is it not fair to ask, if that system which I have proposed had been adopted during the centuries that have elapsed since the present system began, resulting in the destruction of thousands of our fellow-men, I would then faint believe that our forefathers have not so much credited to their account, and that it is reserved for those to enforce this improvement who are alone in a position for doing so. For my own part, I must condemn the general system of mining, as being a disgrace to the intellectual progress of the age, and as I have only the good of the nation, and the security of individuals at heart, I hope to see proprietors deriving benefits from our suggestions, and the suggestors throwing aside those suspicions which too

often arise from a dogged adherence to their own particular proposals. I feel persuaded, however, as no arguments have been adduced to disprove the utility of the same, that the system I have proposed is capable of removing, where it is thoroughly carried out, those heart-rending and increasing events which none can read without feelings of the greatest sorrow. I must, at the same time, withhold any judgment I might otherwise be disposed to hazard upon Mr. S.'s system of machines, hoping that the manly spirit which produced the concluding paragraph of his letter, may have brought to the aid of humanity something which I cannot, from want of more definite information, appreciate. Under the impression, and with a view to a public improvement, I beg to state to Mr. Storey that, as we are entirely unknown to each other, I will, on his producing sufficient security, and undertaking to work the mines on the most approved system, surrender to him one or more collieries on his own discretion, wherein he shall try the experiment for which he claims the approbation of all men. I offer a colliery first to him that has not yet been in work, but for which every preparation is in progress; there are two shafts a few yards from the seam of coal, which is about 4 ft. in thickness, with a level of two miles, without fault or blemish of the mine, and with 500 yards solid on the rise or crop of the mine, which has a regular dip or inclination of 1 yard in 5. I have next to offer a colliery that has been in full work for a few years, with a mine varying from 1 ft. 6 in. to 3 ft. 6 in., a very irregular inclination, sometimes 1 yard in 10; at others quite flat; and, lastly, the same seam of coal in new workings. I shall require only a strict fulfilment of the proposal—viz.: double the present profits—the rest I will surrender to Mr. S., as long as he pleases, a quantity not less than 160,000 tons being worked annually from the collieries—whatever breakage in the coal by the machines is, of course, to act for or against Mr. Storey. Should Mr. Storey still desire to fulfil his position, I shall have great pleasure in giving him any assistance I can afford, and be found ready at any time to complete my share in the experiment—trusting that should this engagement proceed, an improvement may be effected that will prevent the occurrence of those social outrages which strip from the brow of science the laurel wreaths which the finger of art so profusely adorned.—JOHN DARLINGTON: *Alison Hall, near Chorley, Lancashire, May 19.*

ACCIDENTS IN COLLIERIES—NEW-HALL COLLIERIES, BEESTON.

SIR.—Another grievous calamity appears to have taken place at Beeston, in the vicinity of Leeds, whereby other nine poor colliers are hurried into eternity, by means of explosion—the cause, as set forth in the public journals, arising from the candles of the workmen coming in contact with the gas pent up in the gob, or goaf. It is not for me to pronounce whether such a dreadful event might, or might not, have been anticipated, by the circumstances attendant upon the mode of working the colliery, or the amount, or arrangement, of the air current—that is a duty which will devolve upon the coroner and jury; but, as I saw from your last week's paper, that a deputation of colliers is in town, with a petition to Parliament, it surely would be well for them to take advantage of this event, and request an interview with the Secretary of State, so as to have this most recent case properly investigated by competent persons. In collieries which produce inflammable air, gas will accumulate in the old hollows—therefore, it becomes matter of judgment and discretion, how to contrive the internal arrangements, so as either to carry off those gases as made, or to prevent them coming in contact with the lights of the workmen.

Hence, again arises the question, whether the interference of Government would not tend to correct and improve the condition of mines, so as greatly to lessen these calamities.—D. Newcastle-upon-Tyne, May 20.

VENTILATION OF MINES—G. S. C.E.

SIR.—I think I shall scarcely run a risk in assigning, from internal evidence, and the signature, the letter of "G. S. C.E." to Mr. George Shepherd, who delivered a lecture at Lawley Bank. It is an instance, if so, in point of what I uniformly observe, that the appellants for Government interference, are those failing to make a proper use of the materials in their grasp. Thus, Mr. Shepherd calls on a fostering Government to cherish, what three of your correspondents simultaneously have indicated as absurd. These persons always lay much claim to the name of science. I cannot perceive, either as member, graduate, or associate, the name of Shepherd in my list of civil engineers.

D. MUSHET, JUN.

Gloucester, May 18.

DR. CLANNY'S SAFETY LAMP.

SIR.—I expect that you shall be pleased to pardon me if I remark, that I feel ashamed to send a reply, for insertion in the *Mining Journal*, in your next Number, to the very unjust and uncalled-for observations of a person who, under the anonymous assumption of the sacred word "Veritas," presumes to attack me, in my humble efforts in the cause of suffering humanity, and whose paper you have been pleased to insert in your last Number. *Imprimis*, I recommend to "Veritas," that he commence to study the English grammar before he may dare to write for a scientific Journal. Secondly, that he may "screw his courage up to the sticking place," and give his proper designation and *locus standi*—thereby to follow the honourable and just examples afforded in your Journal by Messrs. Moshet, C. Richardson, W. Storey, T. Deakin, with many others. By this honourable and usual plan, we shall be enabled to know persons who are "carboni digni." So far, I agree with "Veritas," that in the Davy and the Stephenson safety lamps there is precipitation of soot, so as to obscure the light; but this has never obtained in my safety lamp, which is, *toto caelo*, the contrary of what "Veritas" asserts, as I stated in a former Number of the *Mining Journal*. I have learnt that Stephenson's lamps are used in four collieries only, yet "Veritas" says, "extensively employed;" let that pass. The person who designates himself "Veritas"—or rather "sine veritate"—calls on Dr. Murray to conjure up a safety lamp of tallow, &c. Now, none but an ignorant person would place Dr. Murray in this manner between the horns of a dilemma; for either Dr. Murray must produce such a lamp, or "Veritas" will prove himself a silly fool for asking a thing which cannot be accomplished, even with Dr. Murray's bias in favour of tallow, or what he significantly designates, mica. "Veritas" remarks "Dr. Clanny should give Dr. Murray fair play in this matter," &c. When did Dr. Clanny do otherwise than give fair play? Again, when did Dr. Murray ever give Dr. Clanny fair play, especially upon the subject of safety lamps? I have not done with the latter, if he provokes me; he will learn through your pages that which I should not like to be compelled to publish. "Let the galled jade wince, my withers are unrued."

Now comes the grand charge of the so-called "Veritas." The words of "Perfidus" are as follow:—"To-day, I accidentally learnt from one of the parties, deeply interested in Jarrow Colliery, that Dr. Clanny's lamp is not employed in that colliery, as was a little time ago published in the *Mining Journal* by Dr. Clanny, but only the Davy lamps; and that, since the explosion, they are working 'her' altogether with lamps. They had a single lamp of Dr. Clanny's sent to them for experiment. This fact is too important a matter for such statements, unbased as they appear to be, on the subject, by Dr. Clanny; and he should be more particular, whatever his natural tendencies, of the sources of information." It will be a difficult matter for me to analyse this farce of erroneous construction; however, I must attempt it, for the sake of truth, not as an advocate for the gross errors of the *classical* "Veritas."

This is truly impressive, especially being from the pen of "Magna est veritas," who has not the moral courage to give us his name and abode, though he presumes to attack an individual whose honour and integrity have never, heretofore, been called in question; but is now attacked by an anonymous writer, whom I dare to give his name. I have been informed this day, and from best authority, that the Jarrow Coal Mine has heretofore been anything but fortunate in respect to the loss of human life by "accidents," as they are called. I never sent any of my safety lamps to the Jarrow pit, but a pamphlet to the late proprietor, Dr. Druitt Brown, Esq.; and I well know that, under the present management, I had nothing discreet or civil to expect—that I took my report from the person who furnished the vituperated safety lamp; and from this colliery only have I ever experienced, of late years, anything but kindness and respect. If I am not misinformed, my lamps, in spite of my opponent, are in use in the Jarrow Colliery. If the viewer do not substitute my safety lamps for the Davy, I will tell him, that with him selfishness is a heinous crime. If my lamp be not used in certain collieries, I hope the pitmen may enter their protest, as in Alderman Copeland's, Staffordshire, where they formerly refused to work with Davy lamps, and now mine are used there generally. I entertain no enmity to any person, though I avoid those I do not like; and, if provoked, I will defend myself, were it even in reply to an anonymous libeller.—W. REID CLANNY: *Sunderland, May 17.*

VENTILATION OF MINES—MR. GIBBONS'S SYSTEM.

SIR.—I hope you will allow me the opportunity of informing your readers, that another explosion took place at the Yew-Tree Pits, Kingswinford, on or about the 11th of May, by which one man and two boys fell a sacrifice—the former a very severe one, and his recovery is very much doubted; one of the boys was, I believe, but slightly burnt. But, Mr. Editor, what will the several advocates of the above system say, when I tell them the work has been, since the above explosion, and, I believe, at this moment, driven on with the exclusive use of lamps? I would ask, Sir, what does this bespeak?—sufficient, I presume, to prove to the most sceptical the errors the projectors have fallen into—lamps—the last resource. Mr. Taylor may term Enos Hodgetts "an extremely ignorant and illiterate man" as often as he pleases, as that will only serve to show the value to be attached to the declaration he got signed by Hodgetts, and every *collier* in the Yew-Tree Pits, stating the system to be good. I am glad to find Hodgetts knows how to speak the truth, as far as his judgment goes, and should be glad if I could say so of his over-lucker. In my last letter, line six, read "April 7 for April 17." HENRY JOHNSON. Dudley, May 19.

VENTILATION OF MINES—MR. GIBBONS'S SYSTEM.

SIR.—Allow me to give you a short statement of the circumstance relating to Enos Hodgetts, referred to in your Journal of May 13th. Whilst driving out a side of work in the Yew-Tree Colliery, we suddenly made an opening into an old side of work of an adjoining colliery, which had been worked out and built up for many years, and which had trespassed into the Yew-Tree coal, unsuspected by the proprietor of the adjoining colliery or by us. The surveyor of that colliery inspected the trespass with me, and agreed to the quantity of coal which should be cut off for protection. Two men, Enos Hodgetts and Heywood Plant, were then directed to build up the openings, preparatory to cutting of this rib, to make it safe. The wall was nearly completed by them, when a slight flash of gas caught the candle of Enos Hodgetts, under the circumstances deposited to Heywood Plant, whose deposition is annexed—but nothing in the nature of an explosion. The circumstance was considered so trifling in the pit, that it was not known to the Charter Masters, or myself, that any man had stood away from his work on account of a burn; and the "dogges," or overmen, never suspected this to be the case, from the trivial nature of the accident. His absence, which, he states, did not excite any surprise—as, during the present want of thick coal-men, they absent themselves at pleasure for two or three days at a time, without assigning any reason; and, in such cases, he has to fill up their places as well as he can.

I have only learnt these particulars by inquiries, made since the 5th May, when it became known to me by the following circumstance:—On Wednesday, the 5th of May, Enos Hodgetts came to me, accompanied by a very decent man, Robert Greenway, saying that Mr. Johnson had been with him that day, to tell him that he must come to Dudley, and make a deposition that he had been burnt. He had refused, as he told him the burn had been nothing. That Mr. Johnson said, if he did not come he would send a policeman for him. I told him he might be easy, as, if any such attempt was made, he could apply to Robert Greenway or me; which, he said, he would do. Hodgetts was called from his bed on Thursday morning (having worked on Wednesday night) by a person whom he knew to be a constable of Dudley, who told him he must come with him to Mr. Johnson, at Dudley, and he, believing himself obliged to do so, accompanied him. He was then asked many questions, which were written down on paper, and afterwards taken before a magistrate and sworn to it. Under what impression he made the statement, I am unable to say, but his declaration, when accompanied by Robert Greenway, and to his fellow-workmen, before and since, are in complete contradiction to it; but he is very ignorant, and slow-witted.

I have narrated the facts, as far as they are known to me, as I shall only have to trouble you with a few observations on "Henry Johnson's" letter of 10th May. Your readers will see, by reference, that the charge of an explosion (so termed) was made by him in his letter, dated 7th April; and that this was the real date of the letter, is proved by your "Notice to Correspondents," acknowledging its receipt and postponement, in your Journal of 10th April. Mr. Johnson now brings forward an occurrence, happening on the 14th April, being seven days after the date of his letter—apparently to make an impression that this incident of 14th April supports his letter of 7th April; and, in his letter of 10th May, says—"To answer a paragraph, contained in my letter of 17th April, instead of 7th April, to which letter my attention was drawn. No comment on this is needed on my part. As to Mr. Williams's pit, also any remark is not required. As to the threats made by me, it appears that Enos Hodgetts says he had heard some other man state that I would give 51 to know," &c. This I deny, but the folly of such a declaration is a contradiction in itself. It is, unfortunately, too well known, that, during the present scarcity of thick-coal workmen, that not only any threats would be useless, but that they are entirely regardless of the most positive orders—even when their own safety is concerned, as it will be pretty clearly seen by a subsequent letter. Love is not in jail for five months—he is at liberty on bail. All that I wish is, that when statements are made, they should be made faithfully, and without exaggeration of the facts. It would then be seen whether the wilful disobedience of orders, the reckless conduct of individuals, or the system of ventilation, was at fault.—This correspondence has already been uselessly prolonged, and it is only circumstances of a very special nature that could induce me to resume it.

Kingswinford, May 19.

"I, Heywood Plant, of Commonside, in the parish of Kingswinford, in the county of Stafford, miner, do solemnly and sincerely declare and say, as follows—namely, I have been a coal miner, and worked in the South Staffordshire district for 35 years, and upwards. I have, during that time, worked in many thick-coal pits in the neighbourhood. I have worked for the last 10 weeks at the Yew-Tree Colliery, belonging to Mr. Benjamin Gibbons, in No. 1 pit. On Wednesday, the 14th of April last, I was at work in the pit, in the first side of work, with Enos Hodgetts—we were building a dam against an encroachment made by an adjoining colliery; the dam was being made for safety, to prevent the gas working out of the hollows made by the encroachment; Hodgetts was moving some slack, in order that he could sit to his work better, and, while doing so, a small quantity of gas gathered in a pot hole, where the coal had broken down in the roof; Hodgetts then commenced throwing in the slack against the hollows, which forced the gas out of the hole, and a very small flash took place, and caught Hodgetts's back; there was no explosion whatever; I was close behind him at the time—in fact, within arm's reach. I did not feel the flash; there was nothing to be alarmed at, and no alarm was made in the pit; it frequently occurs in all collieries in cutting the coal; I went on with my work and finished it; I have been in flashes much worse than the one mentioned, and never took any notice of them; Hodgetts went away, and when he returned I saw his back—there was no sign of a blister on it. If the pit had not been aired in the way it was, the gas from the old hollows would not, in my opinion, be so readily carried off. I have never seen any pit aired so well as Mr. Gibbons's ever since I have been a miner; and I make this statement, declaration, conscientiously believing the same to be true, and by virtue of the provisions of an Act, &c., &c.

"Declared at Dudley, this 10th day of May, 1847, before me, John Roberts, one of her Majesty's Justices of the Peace for the county of Stafford.

"HEYWOOD PLANT."

SIR.—That no misrepresentations may be made, I beg your insertion of the following facts, which so fully display the utter contempt of orders, and reckless carelessness of thick coal colliers here. I should premise, that I have no direct control or authority over them but through the medium of the Charter Masters—Cooksey and Fellows—who employ the men, and who are the most respectable and careful men possible. My duty is to give written orders to them as to the measures proper to be pursued in opening the works with safety; and they give their orders to the dogges, or overmen, who are constantly down the pit, and superintend the workmen. It is a standing order in all pits—and every workman knows it—that no man shall recommence work in the air-heads till they have been tried by safety lamps; but, in this case, Mr. Fellows himself had given a special order to the man employed in the air-head the night before, to which he promised attention; and the overman, who superintends the pit, desired him the following morning whilst he was in the gate-road, to wait till he had tried the safety lamp in the air-head, which he promised to do. Could it be believed, that the moment he turned his back to fetch it, that this man took a lighted candle, and went up the shaft? The consequence was, that some gas, which had collected in about a day's work in the air-head, and in which he had left the slack as he ought not to have done, ignited, and injured his head severely; and, in his surprise, he dropped down the shaft, and injured his head severely. It, likewise, burnt two boys very slightly who were at the shaft—one of them so little, that he returned to his work next morning; and the other, not much. This man is an old experienced workman, and has always been considered one of the most careful of men; and he has driven 1000 yards of heading, and more. The man blames himself as severely as any one can. He acknowledges the repeated orders received, and his neglect of them; he perpetually has asked pardon of Mr. Fellows—says he cannot account for his conduct, but supposes he was mad. Whilst men are so scarce, obtaining high wages, and carefree of discharge, this circumstance sufficiently proves the disregard of orders of their employers, and even of their own safety. The driving of the air-heads is a similar operation in all thick

WATER-BALANCE WINDING MACHINE.

DESCRIPTION.

A A A A, the pits; B B B B, plate-iron water-tanks; C C, two wagons; D D D D D, part of the rails, and the bridge across the top of the tanks; E E E, different views of the cross connecting the tanks and wire ropes; F F, water-pipes, provided with valves, for filling the tanks—to be opened and shut by levers, under the command of the attendant; G G G G, the walling, or steaming, of the pits; H H, exit valves, at the bottom of the tanks. The large wheel has a groove to receive the rope, or chain, as the case may be, and furnished with a brake, to regulate the motion and grip tight, as the wagons reach the proper places for pushing off and on. It will be necessary to attach a rope (or chain) to the bottom of the tanks, similar to that annexed, in order to keep up the equilibrium thro' the whole depth of the pit; for, where the ground is favourable, one elliptical pit will be a saving in sinking and steaming, as well as in the size of the wheel, which may be proportionably less.—The upright pipe, seen behind the wheel, may be surmounted by a cistern, to relieve the pipes and joints from the shock occasioned by suddenly checking the momentum of the water current along the horizontal pipe.

It should be understood, that guide-rods, though not shown, are necessary to keep the tanks steady.

It is now 20 years since I erected one of these machines, which has been in constant work ever since, and is still raising 500 tons, from a depth of 50 yds., in 12 hours.—JOHN WALKINSHAW: *Coleford, May 8.*



VENTILATION OF MINES BY A JET OF STEAM.

SIR.—I beg to submit the following suggestion to the consideration of your readers. From attentive reflection on the subject, I am induced to believe the idea will be considered as one of practical value.

London May 12.

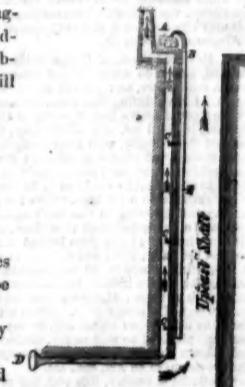
B.

DESCRIPTION.

A, steam-boiler.
B, steam-pipe.
C, a jet of steam.
D, the funnel, with a pipe that takes off the gas from the works, which may be continued to any part of the mine.

E, a jet in the upcast shaft, which may be applied if required.

The chimney will act for the boiler, and also for the gas to escape.

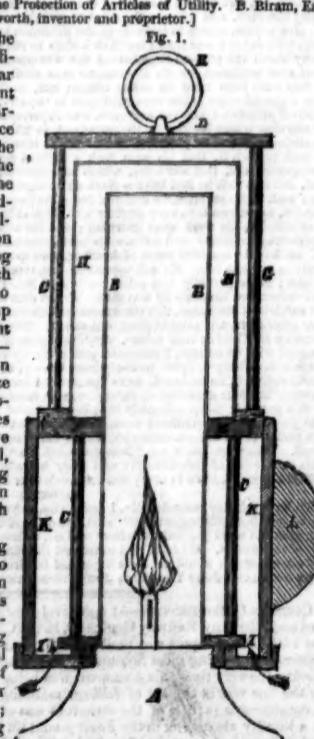


MR. BIRAM'S IMPROVED MINER'S SAFETY LAMP.

[Registered under the Act for the Protection of Articles of Utility. B. Biram, Esq., of Wentworth, inventor and proprietor.]

The imperfections of the "Davy" lamp are now sufficiently notorious; every year furnishing a lamentable account of additional evidence confirmatory of the small dependence to be placed upon it. The fouler and more explosive the atmosphere the greater is the risk of the gas becoming red-hot, and inflaming the coal-dust which accumulates upon it, or of some of the wires being ruptured—in either of which cases an explosion is certain to ensue. Whenever, too, the lamp is exposed to a strong current of air—a very common case—the flame is apt to be blown through the meshes of the gauze into the surrounding atmosphere, which, if foul, explodes instantly. Explosions have been known to be occasioned, merely by the miner's waving his lamp quickly about, when seeking to penetrate through the gloom around him.

With the view of remedying these defects Mr. Biram—who is himself largely engaged in coal-mining operations—has invented the improved lamp represented in the accompanying figures:—Fig. 1 is a sectional elevation, and fig. 2 a plan of the lamp. A is a reservoir for oil; B a cylinder of wire gauze; C C C C, four pillars of strong wire, which connect the bottom of the lamp with a metal ring E, which closely surrounds the gauze cylinder B. F is another ring which is screwed on to the outer periphery of the ring E. G G G G are four wire pillars raised on the ring F, which support at top the cap, or plate D, to which a ring R is attached for carrying the lamp. H is a second gauze cylinder, which surrounds the upper half of the inner cylinder B, and is made fast to the top of the ring E by means of a flange at bottom, which is overlapped by a flange projecting from the inside of the ring F; I I is a gallery which is attached to the bottom part of the lamp, and serves as a support to a cylinder K, which may be of strong glass, made large enough to be slipped freely over the ring F, or it may be of tin, or copper tinned, and polished inside, and provided with a lens



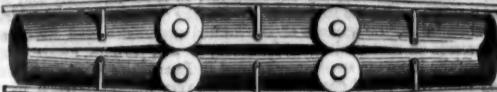
L, attached to one side of the cylinder K. The second gauze cylinder H is intended not only to protect the inner cylinder B from damage, but to intercept the coal-dust and prevent it from falling on B, which, by being kept clean, is rendered less liable to become red hot. The cylinder K, again, is designed to protect the flame in strong currents, while the lens L serves to concentrate the light on any particular spot. The cylinder and lens may be taken off when their assistance is not required.—*Mechanics' Mag.*

The Song of Steam.

Harness me down with your iron bands—
Be sure of your curb and rein;
For I scorn the power of your puny hands.
As the tempest scorns a chain.
How I laugh'd, as I lay conceal'd from sight
For many a countless hour;
At the childish boast of human might,
And the pride of human power.
When I saw an army upon the land—
A navy upon the seas,
Creeping along—a snail-like band—
Or waiting the wayward breeze;
When I mark'd the peasant faintly reel
With the toll which he daily bore,
As he feebly turn'd at the tardy wheel,
Or tugg'd at the weary oar:
When I measured the panting coursier's speed—
The flight of the carrier dove—
As they bore a law that the king decreed,
Or the lines of impatient love—
I could not but think how the world would feel,
As these were outstripped afar,
When I should be bound to the rushing heel,
Or chain'd to the flying car.
Ha! ha! ha! they found me at last—
They invited me forth at length—
And I rush'd to my throne with thunder blast,
And laugh'd in my iron strength.
Oh! then ye saw a wondrous change
On the earth and ocean wide,
Where now my fiery armies range,
Nor wait for wind, or tide.
Hurrah! hurrah! the waters o'er—
The mountains' steep decline,
Time—space have yielded to my power;
The world—the world is mine!
The rivers the sun hath earliest beat,
Or those who his beams decline—
The giant streams of the queenly West,
Or the orient floods divine:
The ocean pale where'er I sweep,
To hear my strength rejoice,
And the monsters of the briny deep
Cower, trembling at my voice.
I carry the wealth and the lord of earth—
The thoughts of the god-like mind;
The wind lags after my flying forth—
The lightning is left behind.
In the darksome depths of the fathomless mine
My timeless arms doth play,
Where the rocks never saw the sun decline,
Or the dawn of the glorious day.
I bring earth's glittering jewels up
From the hidden cave below,
And I make the fountain's granite cup
With a crystal gush o'erflow.
I blow the bellows—I forge the steel
In all the shops of trade;
I hammer the ore and turn the wheel
Where the arms of strength are made;
I manage the furnace—the mill—the mint;
I carry—I spin—I weave;
And all my doings I put into print
On every Saturday eve.
I've no muscle to weary—no breast to decay—
No bones to be "laid on the shelf";
And soon I intend you may "go and play,"
While I manage the world by myself.
But harness me down with your iron bands—
Be sure of your curb and rein;
For I scorn the power of your puny hands,
As the tempest scorns a chain.

CLARKE AND VARLEY'S PATENT RESILIENT ATMOSPHERIC RAILWAY.

The experimental line of railway laid down near the Poplar station of the Blackwall line, has now been at work during three weeks, and bears out, in a remarkable degree, all the advantages which we have, on former occasions, attributed to it. Numerous visitors daily attend to witness its working; and, in apparently every case, go away convinced of its superiority, in point of economy, speed, and safety. The patentees have so simplified the system, that the tube now merely consists of wrought-iron, one quarter of an inch in thickness; and which, closing by its own spring, and the external pressure of the atmosphere, forms a perfectly air-tight joint. A section of the tube now merely forms a circle, without lips, valve, or other incumbrance, or lubrication, of any description; and so perfect is it, that the vacuum can be maintained for two hours after the air-pumps have ceased working. The following diagrams represent a section of the tube, with the edges just open, and the means by which the opening and the passage of the coulter is effected:—Along the whole length of the



tube, on each side are continuous iron bars, pinned and keyed at intervals to it. Attached to the leading carriage of a train is a frame, in which four wheels revolve in pairs, and being somewhat wider than the distance between the bars, force them open, and, consequently, the tube with them, allowing a free passage for the coulter to pass, without touching the edges, and, consequently, without friction from that source; and the wheels acting on a double rolling motion, there is scarce any from the pressure against the bars—indeed, so trifling is it, that one individual can, with the greatest

ease, propel the experimental carriage now employed, and which weighs $2\frac{1}{2}$ tons. The power now required on the London and Blackwall line to move the rope alone, by which the trains are drawn, is, we believe, 250-horse power—a force which it is estimated, on the resilient system, would work the whole of the trains, one starting each way every 15 min.; and, as compared with locomotive power, the economy must be enormous—probably a saving of from 800*l.* to 1000*l.* per week; while provision could be made for locomotive engines passing the Stepney station, on the proposed branch from the Eastern Counties line. It does appear to us, that the system is most admirably adapted for this particular railway; and as the model is a tube 15 in. in diameter, and, consequently, of nearly full working size, every dependence we think may be placed on its answering in practice equally well, with the results shown by the model.

The safety of this mode of propulsion is clearly evident; and as to the speed to be attained, it appears to us to be almost unlimited. With the model now under notice, it is never worked to a higher pressure than 15 in. of mercury; and a speed is obtained quite equal to the Blackwall trains, when going at their greatest rate. With the complete failure of another system of atmospheric propulsion on the Croydon Railway, much obloquy has been raised against the principle itself, which it by no means deserves; and we feel assured that this system, reduced as it undoubtedly is to the extreme of simplicity, will yet be adopted; and, having once obtained the support of a railway, its advantages will be so apparent, that it will, doubtless, be taken up by others. For Ireland, in particular, it would appear to be highly desirable, furnishing railway communication at a low cost of construction, at a working expense far lower than has ever yet been accomplished; and the more the tube is worked, the more perfect and air-tight will it become—a property which, perhaps, can be claimed by no other piece of machinery. Some remarks will be found elsewhere.

MACINTOSH'S PATENT REVOLVING ENGINE.

The engine, illustrated by the accompanying diagrams, is one which, though it may be denominated as of the rotary class, and thereby condemned by many, yet it is one that has marked out a course so peculiarly its own, and differing so widely from all its predecessors, that we have deemed it a good example to lay before our readers. The patent for this engine was obtained several years back, by an American gentleman, then resident in Glasgow; who has lately been experimenting with it, at the Polytechnic Institution, where a carriage on this principle, running on a circular railway has for some time been exhibited.

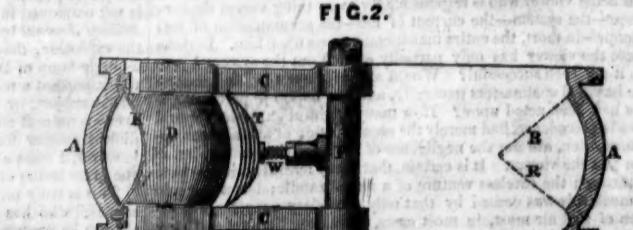
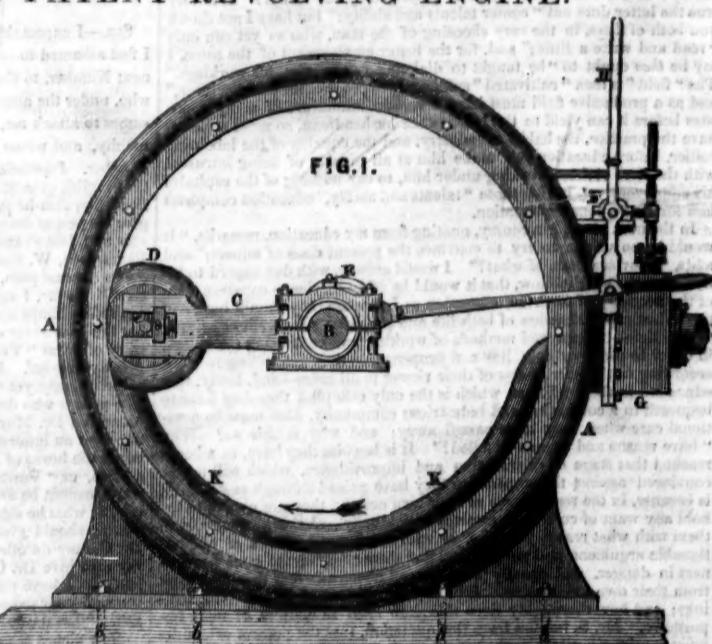
The peculiarity in this engine, which distinguishes it from its predecessors, is the application of a flexible belt, by which the steam is admitted, such belt being affixed to the cylinder. To convey the idea to our readers, let them imagine a cylinder of the ordinary form laid on its side, and resting upon the top and bottom flanges; the sides of the cylinder, which in ordinary cases are parallel, are in this case of a concave form. The flexible belt is strongly secured to the outer ends of such cylinder, or roller, of a corresponding curve to the cavity on the sides of the cylinder, next fitted to the ends of the cranks, which are affixed to the main shaft—the engine is then complete. On steam being admitted to the flexible belt it becomes distended, and the steam acting against the fixed end of the belt, renders any motion in that direction impossible, it therefore presses against the roller, on the outer ends of the crank, which, receding from such pressure, communicates the motion at once to the main shaft, without any intermediate mechanism.

The belt may be of any material that offers a sufficient degree of strength, flexibility, and ready means of being made impervious to the pressure of the steam. The inventor generally employs strong canvas or sail cloth, prepared by pressing caoutchouc, mixed with plumbago, into the interstices; this being effected by passing the canvas, when coated with the mixture, between smooth rollers: the plumbago is used in the mixture, in order that the canvas may afterwards more readily receive a coating of copper by placing it in a solution of that material, and subjecting it to a current of electricity.

DESCRIPTION.

Fig. 1. A A is a steam cylinder, firmly bolted to sleepers, by the holding down bolts b b b b. B, the main shaft, to which the cranks C C are fixed. D is a roller, working in anti-friction bearings, at outer ends of such cranks. E, eccentric fixed to the main shaft B, for giving motion to the rocking shaft F, which is employed for the purpose of working a slide, in the slide casing G, so as to be enabled to work expansively when desired. I, steam-pipe, leading from boiler to slide casing, from which it passes through suitable ports to the flexible belt, which is shown distended at K K; the engine is thereby constrained to move in the direction of the arrow. Should it, however, be desired to reverse its motion at any time, all that is required is merely to raise the eccentric rod out of gear, and to change the position of the slide by means of the lever, when the induction port becomes the induction, and vice versa. In this figure the framework conveying the journals for the main shaft, is omitted from showing the action of the belt in a distinct manner. Fig. 2. represents a cross section of the cylinder, for the purpose of explaining more clearly its construction, the same letters apply as in the foregoing description. R R shows the radius of the curve, to which the cylinder is turned, being a corresponding one to that of the roller D, which roller is kept up to the cylinder, by means of the strong spring and adjusting screw shown.

A vessel 89 ft. long, and 11 ft. beam, constructed by Messrs. Ditchburn



and Mare, is being fitted with a pair of engines, similar in form to the foregoing, for the purpose of driving a pair of Capt. Hancock's cycloidal paddle-wheels. We may mention, that in France, as early as 1838, this principle was patented by Mr. Macintosh, and a railway laid down on the grounds of M. Rattier, at St. Denis, on which a speed, equaling 60 miles per hour was attained. This plan would have been adopted for the transit of the mails between Paris and Calais, but was ultimately abandoned—it being found, that on the temperature of the atmosphere falling below the freezing point, the flexible tube, which was in that case intended to be worked by compressed air, became too rigid for practical purposes. Since that period, however, the valuable improvements made by Hancock and others in vulcanizing India-rubber, now found, in a temperature so low as 30° below zero, to retain all its flexibility, and not to be liable to decompose from variations of temperature. Since these improvements, M. Andraud has commenced laying down a line on this principle at Paris. There was also on the Clyde, in 1841, a boat fitted with a pair of 10-horse engines on the same principle, with the exception of the peculiar arrangement of the belt, which forms the subject of the subsequent patent now referred to.

THE ATMOSPHERIC SYSTEM.

TO THE EDITOR OF THE MINING JOURNAL.

RESPECTED FRIEND.—It is probable that, before long, we shall see the atmospheric mode of propulsion tried on a sufficiently extensive scale to convince the "eminent engineers" of this country that it possesses advantages to which the most improved locomotive system will never approach. That the atmospheric system will be extensively adopted, can hardly be doubted; but instead of the engineers influencing public opinion, as was the case in adopting the locomotive engine, it would seem that, in this case, it is public opinion which must influence the engineers, as only a few have as yet pronounced in its favour—that a more perfect mode of transit is required, is proclaimed by the numerous accidents which occur in spite of every precaution. I do not, however, believe that the locomotive will be entirely driven from the road by the adoption of the atmospheric system. The steam horse will be employed in many localities in spite of his formidable rival—a thought which must be very consoling for those who may have thought it better for the people to reconcile themselves to broken heads and shattered limbs, than for the manufacturer to diminish his profits by being driven off the field; each of these might persuade himself that he can sanction the adoption of the atmospheric principle without being ruined by his philanthropy.

During several years past, I have considered the vacuum principle as a discovery which would be the means of obtaining the full use of that wonderful agent, steam—steam-power being by its means transferred to any distance without difficulty. We have also the compressed-air system—in the perfection of which, nearly as many engineers have dabbled as in the steam-engine itself; yet it is, perhaps, as far from being adopted as ever, in spite of the recommendations of Dr. Jules Guyot, of Argenteuil, who says, that on the vacuum principle, it requires a power of two to produce a power of one—while, by compression, a power of one obtains a power of one! This is rather wonderful; there is a great deal of loss by friction on the vacuum principle, but none whatever by compression! The mystery is, how the Doctor proposes to compress the air; then he not only gives his adhesion to the compressed-air system, but informs the world, that "his opinion of traction by exhaustion is a paradox in physics, a monstrosity in mechanism, and an absurdity in speculation." This will prove difficult to digest with the Clarkes, Pinkuses, and Pilbrows, and might lead them to "shed tears wholesale and retail." The vacuum principle is pronounced a monstrosity in mechanism. Well, perhaps, it is after all; for it is evidently monstrous strong. I have seen a large oak receiver broken to pieces by it, with such a powerful effect, that the whole building in which this took place was shaken as if by an earthquake; yet, although I had my hand on the receiver at the time, I received no injury—the air being driven inside. My opinion is, that the vacuum principle has several advantages over the compressed-air. In the first place, a tube, comparatively slight, can answer; secondly, the machinery required to form a vacuum is extremely simple; and, thirdly, the system is totally devoid of danger—while nothing is liable to be thrown out of order, and the whole is managed with the greatest facility.

I believe that, in proportion as the vacuum principle will be experimented on, we shall find means of adopting it for various purposes hitherto unthought of. In some of my unpublished papers, written several years since, I have detailed plans for transferring steam-power by means of the vacuum in every house and store of manufacturing towns, by laying pipes in the streets, similar to the gas and water-pipes. An atmospheric engine, nearly similar to a steam-engine, but much more slightly constructed, having two slide valves communicating with the vacuum pipe and two with the atmosphere, would work as regularly as a steam-engine, provided the vacuum would be maintained in the receivers at the other end of the pipes, which receivers might be, in some cases, in the neighbourhood of coal mines, as only a pipe would be required to communicate the receivers with the branch pipes in the town. There are few trades in which such engines would not be useful; they might be made very small, or of several horse-power; and a meter could be easily constructed to ascertain the quantity of air entering the vacuum pipe, or the engine itself might be made to register the number of its evolutions: of course, the air could be made to work expansively, as a pressure not exceeding 8 or 9 lbs., would be sufficient in the receiver. These engines could be put in motion or stopped, by opening or shutting the communication between them and the vacuum pipe. Another purpose to which atmospheric pressure may be applied—and I suppose it has never been thought of before—is music. In the accordion, a half-broken sound is produced by alternately expelling air from a box, and forming a partial vacuum—in either case, the sound is the same; and, of course, if a partial vacuum was formed in a large box, having several hundred keys, it would form a musical instrument, which would produce a greater variety of sound than any other, and, by combining this instrument with the piano-forte, it would be easy to place the keys of the two instruments in alternate positions—thus forming one instrument of very great power. A vacuum of 1 lb. to the square inch, would probably be sufficient; and an uniform degree of pressure might be obtained by means of a self-acting valve (a drawing of which I have by me; but which cannot be explained without a wood-cut). The vacuum might be formed by communicating the box with a receiver at a great distance, as explained above; or by a small air-pump, put in motion by a small fly-wheel and treadle—the air would be thus exhausted from a receiver, communicating with the musical box by means of the self-acting valve, placed in a pipe. I suppose I may give the hint to amateurs of "fine squeaking," and to eminent musicians, without danger of their claiming the invention as their own, under the pretence of modifying it, for the purpose of playing an "old tune" for their own amusement? They may borrow the invention without borrowing honesty from "eminent engineers."

Another part of the subject which deserves attention is, as regards the most economical mode of forming the vacuum. The plan of using air-pumps, worked by steam-engines, now adopted, although expensive, is so certain in its effects, that it should not be banished in too great haste; various other modes have been proposed, and among these the substitution of wind and water-power for steam; but these are to be objected to for several reasons, as they require expensive and unwieldy machinery, and can only be depended on at irregular intervals—consequently, would be useful only as auxiliary power. Another plan is, to obtain the motive power from the rising of the tide, and, in some localities, it might be adopted; but with what economy can hardly be ascertained except by experiments on a large scale? But another mode, perhaps superior to any other, if a sufficiently perfect apparatus can be devised for its application, is, to form the vacuum by the condensation of steam in a receiver. I have found, by experiment, that a vacuum cannot be formed by this plan in an ordinary receiver, unless high-pressure steam is used; and, if compelled to use steam at a pressure of 15 lbs., we might probably use the air-pump, with the steam engine, as economically. The question then is, can the steam be kept separate from the air in admitting it to the receiver? I have tried many experiments to attain this end. This was by filling an upright cylindrical receiver with water, then leaving it to escape at the bottom, admitting steam at the same time, at the top, at 21°. The water was rapidly expelled by the steam; but as soon as no water remained in the receiver, the air rushed inside almost as fast as in a vacuum, although the steam was still entering the receiver at the top, from the boiler, through a small pipe. This convinced me that steam is rapidly condensed by cold air; and that this must prove an insurmountable obstacle to forming a vacuum by expelling the air by the direct action of steam. On using high-pressure steam, the difficulty disappears; for a part of the steam in condensing, heats the surrounding air; and, before the cold air can penetrate through this strata of steam and warm air, the high-pressure steam, continuing to rush in the receiver very rapidly, creates a space almost devoid of air—so that, on the steam being condensed by cold water, a comparatively perfect vacuum is obtained; but on no occasion have I been able to obtain more than 12 lbs. per square inch, although high-pressure steam might have rushed in through the receiver during more than 10 minutes after being filled. Benningfield, the inventor of the electric gun, who was present when I made some of these experiments, thought that some air, or other gases, must be combined with the steam in the boiler—and, consequently, that a perfect vacuum could never be obtained by this plan; and it certainly seemed difficult to account for it otherwise, as the receiver was perfectly air-tight. It will appear evident, that unless the steam can be kept distinct from the air, we cannot form a vacuum economically by its condensation; and to effect this, I would propose to construct several iron cylindrical receivers, placed horizontally, and lined inside with wood, so as to have an even surface inside. I would construct a piston for each, of an area nearly equal to the receiver, by forming a rim of light wood, about 4 in. wide, and 6 in. thick, and fasten a hose-pipe, filled with water, round its circumference. The centre, or main part of the piston, would be simply a very thin sheet of copper, so that the whole would be very light; but,

of course, it would be impossible to drive this piston with steam at 21°—consequently, a mechanical power would be required.

I would fasten the piston in the centre to an iron bar, twice the length of the receiver; this bar would be cut in the form of a screw on its whole length, but with a long spiral thread, and passed through "nits" at each end of the receiver; the piston being fastened exactly in the centre of this spiral piston-rod, would, on being turned round, advance rapidly towards the other end in a spiral direction. On admitting steam at the end of the cylindrical receiver, the spiral-rod would be put in motion, and the piston would progress, in proportion as the steam would enter. The piston and rod should be constructed, so as to permit its being worked in either direction—so, that by admitting steam at the other end, the vacuum could be formed a second time, and so on, *ad infinitum*. This would be, in fact, an immense condensing air-pump, which could be made to work with great rapidity—so that it would be easy to store the power in large receivers at any distance. The putting in motion of the piston could be easily arranged to be almost self-acting, by means of a small atmospheric engine; and I believe, that if this plan was adopted on railways, the quantity of coals consumed would be wonderfully trifling, as there would be no loss of power worth taking into account—in fact, as a means of making steam-power available, it is probable that a superior mode cannot be found, as regards the economy. With a few such receivers, the largest mines could be ventilated without difficulty; by having branch pipes in every direction, a continual rush of air would take place from every part of the mine into the receivers, and, of course, fresh air would enter from without in the same proportion. To conclude—the vacuum principle is a field rich for scientific investigation; and it is probable that when it will have been examined as much as it deserves, the result will astonish those who see nothing in it."—JOHN DE LA HAYE: Liverpool, 4th mo. 14.

LITERARY NOTICES.

The Bank of England Justified in their Present Course. By JAMES WARD, Esq. London: Smith, Elder, & Co.

This is a pamphlet from the pen of the author of *How to Reconstruct the Industrial Condition of Ireland: Railways for the Masses, and not for the Few: The True Policy of Organising a System of Railways for India, &c.* The author takes a general review of the several drains which have been made on the Bank, from 1797, their causes, the results which followed the restoration of confidence, and the information acquired from these results. From these investigations, he shows what course the Bank should pursue in the present crisis, and observes, "Having analysed the history of all the considerable drains of gold which have occurred during the last 50 years, previous to the present one, differing as widely in their origin, and treated by the Bank in so diametrically the reverse of each other, we may, perhaps, apply this history for the induction of some general principle upon which the Bank should act upon such emergencies." The sums charged against the Bank are, that during the awful deficiency of 1847, in the harvest of last year, and when between August 1846, and April 1847, 6,119,658. In gold was drained from the country in exchange for corn, the Bank increased their issues by that amount; when, according to the "Cochrane" of Capel-court, they ought to have been ten times of every note. The author proceeds to show, that in this mode of proceeding they were perfectly right; that the returns show that they entered into fear of their past policy; and that they are acting more wisely, as well as most liberally, under the system they are now pursuing. To all who take an interest in the intricate workings of our monetary system, this little work will be perused with much satisfaction, and to many of its general readers without much useful information.

Private and Public Guarantees for Persons appointed to Offices of Trust Considered. By JAMES KNIGHT, Esq. Edinburgh: Wilson, Royal Exchange.

We do not often occupy our columns in reviewing publications other than those directly devoted to the objects of the Journal, but we cannot omit taking somewhat particular notice of the pamphlet before us, from the great importance of the subject on which it treats, to every one connected with public establishments of whatever denomination. A *Preamble on Banking in the Metropolis* was lately published by the same author, in which he causally alludes to the topic of the guarantee required to be given by those employed by such companies, with reference more particularly to the parties, or party, who may grant that security. It has met with a very flattering reception in the City, and much so, that it is already passing through a third edition; and, at the suggestion of many influential gentlemen, Mr. Knight has been induced to give his opinion, in the subject of private and public guarantees for persons appointed to offices of trust. In a more extensive and general form. He observes, in the first place, that every one who takes an interest in the well-being of society must admit that there is no subject more worthy of consideration than that which tends to promote its advancement; and he very justly considers, that the mode of granting security for persons appointed to offices of trust is capable of considerable improvement, and may be made much more safe and convenient for all parties, and thereby add to the welfare of the community. It appears, that until the year 1842, security for the good conduct and faithful discharge of the duties of persons engaged in public offices, was provided solely by the bonds of private individuals—viz.: friends or relatives. Without any prejudice whatever to the efficacy of many private bonds. Mr. Knight considers that a general rule is the bond of a public company, established on principles similar to a life insurance, would be preferable; and, indeed, that there is reason to believe that the time of private security will cease to be one of the duties of life. He observes, that the most unexpected events may, in one way, destroy the private bond of its value—as, for instance, death, bankruptcy, &c., and, consequently, that the assured has to seek among his friends for a substitute, which, unless surrounded by wealthy relatives and acquaintances, he may have great difficulty in obtaining; and thus, perhaps, impairs, if not entirely frustrates, the future prospects of the most deserving individuals. There are reasons, also, which prevent even those willing to assist from increasing the fidelity of others. Among several, the author mentions that it has of late years become a customary stipulation by persons in all professions and trades, upon entering into partnership, that no member of the firm shall be permitted, upon any pretence or consideration, to become security for the fidelity of others—thereby preventing many well-disposed persons from placing themselves in the responsible position of bondsmen, even where the interests of a son, a near and affectionate relative, are at stake. Mr. Knight, where he alludes to a company, which was established in Edinburgh in 1845, under the title of the British Guarantee Association, and to which an Act was granted in the course of last session, for the express purpose of carrying on the principle of public security. The amount of capital is 250,000, subscribed for by about 450 individuals, of undoubted means and responsibility. But the Act stipulates for an increase of capital, in proportion to the amount of policies or bonds issued by the company. Each director must be the holder of 100 shares as a qualification.

The proceedings of the company are entirely subjected to the control of the Board of Trade, by requiring the company to return annually a list of shareholders, and a balance-sheet; the Board of Trade having power at any time to direct the paid-up capital to be increased. The liability of the shareholders is to be unlimited. We then have a copy of the Treasury Minute, dated the 16th of February, 1847, which was then printed by order of the House of Commons, in which their lordships consented to accept the guarantee of this company, and sanctioned the form of policy to be issued. By their order, the bond of this company is received as guarantee for the fidelity of all persons holding offices of trust under the Crown, such as the departments of the Treasury, the Exchequer, the Admiralty, the Customs, the Excise, the Savings Banks, the Post-Office, as well as of those engaged in the administration of the Poor Laws in England and Wales. This company is also the only one of such a nature which provides a bond for this purpose, duly stamped. By the payment of a small annual premium, any person, whose character and course of life will admit of investigation, may render himself independent of private friends and relations, and obtain that which is often the best introduction to a valuable appointment. It is, as Mr. Knight rightly observes, a novel feature in public enterprise; but it is one of those numerous instances, in which manifold advantages accrue to society by the combination of individuals, to effect that which, in their private capacity, they are to a great extent incapable of performing. It is a subject, too, which has now become of more importance than ever, from the numerous public companies which have been established within the last few years; and the directors and the officers of which would do well to consider whether it would not be for their mutual advantage to adopt as a rule the guarantee of a company such as is so able and lucidly explained by Mr. Knight. We cannot conclude this notice, without expressing our opinion as to the very clear and distinct manner in which the author handles his subject, and which cannot fail to convince his readers of the great advantages attached to the bond of a public company, properly constituted, over that of a private individual, to whom so many accidents may happen to annual his guarantee.

IMPROVED BELT FOR DRIVING MACHINERY.—At the last meeting of the Liverpool Polytechnic Society, Mr. J. Boult exhibited a specimen of an improved description of belt for driving machinery, of which R. R. Whitehead, Brothers, of Manchester, are the patentees. It is made from wool, carded, spun, woven, and well milled, then passed through a composition to make it firm and adhesive, the latter process being the subject of the patent. It was stated to be more durable than the common leather belt, also less elastic, in consequence of which it can be worked slacker, and thus effect a saving of power.

GRATIFYING COMPLIMENT.—At the annual meeting of the Reform Club, London, W. H. Bond, Esq., their late secretary, and now secretary of the Cornwall Railway, was unanimously elected an honorary life member of that institution.

This we believe, is the only instance that has occurred of so spontaneous an expression of cordial approval having been manifested towards a retired secretary by the members of any similar institution.

AN OLD PROVERBIAL SAYING IN CORNWALL.—

By T. Ros, Pol, Lan, Caer, Pen.

You may know the most Cornish-men.

In no other county of England are there so many local surnames as in Cornwall; and as the names of places are almost derived from British roots, the family nomenclature of that peninsula differs materially from that of the rest of England. Tre, signifies a town; Ros, a heath; Pol, a pool; Lan, a church; Caer, a castle; and Pen, a head.—*Lower.*

The materials already used in building the new Houses of Parliament, include eight to nine hundred thousand tons of stone, twenty-four millions of bricks, and five thousand tons of iron.

DEATHBLOW TO THE LOCOMOTIVE!—We had the privilege of a "private view" of a new invention by Mr. William Martin, the National Philosopher, which, to use his own expressive phrase, will "hobble Hudson." It is to "supercede the locomotive." Mr. Martin dispenses with coke and steam, and falls back upon hand-labour. Two or three men, turning a crank, will move a train at the speed (as the Americans would say) of "greased lightning." We congratulate Mr. Martin on his great mechanical achievement. It is simplicity is remarkable.—*Gateshead Observer.*

Water, in freezing, crystallises in filaments which are uniformly joined at angles of 60° or 120°. The word crystal originally signified ice.—In a boiler the water near the bottom is the hottest, because it is bearing an additional pressure proportioned to the depth, and does not, therefore, give out the steam which it would part with if a little higher up.—*Illustration.*

IMPROVED LIFTING JACK.

MANUFACTURED BY

GALLOWAYS' AND CO.,

KNOTT MILL,

MANCHESTER.

RALEY'S PATENT
LIFTING JACK.

JACK.

LIFTING JACK,

LIFTING JACK.

MINING ADVENTURERS' SUBSCRIPTION ROOM
ORIGINAL REGISTRY OFFICE,
For the Sale and Purchase of Mining Shares.
CROSSMAN, SOMMERS, AND CO., AGENTS,
28, THREADNEEDLE-STREET, LONDON.

PROSPECTUS.

It is a subject of general regret, and continual complaint, amongst parties extensively engaged in mining operations in Cornwall and Devon, and who are annually devoting much time and money to the development of the mineral resources of this country, that there is not a sufficient and never yet has been, an open and well organised Market for the Sale of Mining Shares.

It is, by such parties, universally admitted, that the absence of an office for the registry of Mining Shares on Sale, has entailed, both on the seller and the purchaser, innumerable evils, under which the mining interest has hitherto suffered, and under which it will continue to be depressed, until a system be adopted, embracing the *requisite publicity* which should be afforded to all property for sale, with the *prudent concealment* of all personal facts which are not *essential* in establishing its *intrinsic* or *marketable* value. To obviate this evil, and in pursuance of a plan suggested by several of the most influential mining adventurers.

Messrs. CROSSMAN, SOMMERS, & CO.

beg leave to announce, that they have ESTABLISHED OFFICES at No. 28, THREADNEEDLE-STREET, LONDON, wherein they propose to CONDUCT THE BUSINESS OF GENERAL MINING SHARE AGENTS, upon the following principle, to the rigid fulfilment of which they hereby pledge themselves:—

To abstain from all jobbing in shares, and from the purchase of shares on their own behalf, whilst professing to act as agents for the sale or purchase for others.

To register, and submit such register to all applicants, the number and price of all shares of which a sale is authorised—such authority to be produced, if required, upon the completion of any transaction.

To receive one uniform rate of commission—such commission to be chargeable upon the party authorising the sale or purchase, at the rate of £5 per cent., if the amount be under £50, and £3 per cent. upon any amount exceeding £50.

To register all offers for shares, and to submit the same to such parties as shall have registered their shares at this office.

To receive, and lay open for inspection, reports from authenticated agents, or well-qualified parties only—such report being obtained upon absolute survey and inspection; and to abstain from the sale of shares in any mine of which the debts and liabilities at the last audit of accounts, cannot be obtained.

The offer for quotation in the *Mining Journal*, and in any other weekly paper devoted to such purposes, the price of shares registered for sale; as also the price upon which a sale or purchase has been effected, and upon which the commission has absolutely been paid.

In connection with the foregoing, and under the support and patronage of many influential mining adventurers, Messrs. Crossman, Sommers, and Co. have appropriated a room, intended to form a nucleus of a MINING ADVENTURERS' ASSOCIATION, OR SUBSCRIPTION ROOM.

The annual subscription to be One Guinea, which will entitle the subscriber to the daily use of the room, of the mining connected, and to the depositing and exhibiting of specimens of ore, and reports connected therewith.

The above annual subscription shall entitle a mining company to the exhibition of specimens, reports, and the *entire* of their purser or captain.

It is intended, should this subscription room receive the support and patronage of adventurers generally, to obtain more ample accommodation for establishing an association in every respect commensurate with the important interest thereby represented; and to attempt to associate with mining adventurers such scientific parties, not being adventurers, as may be desirous to cultivate, or extend, a knowledge of this most important branch of national wealth, by affording the practical miner and the geologist more frequent opportunities of communication and association.—March, 1847.

WHEAL BEAM TIN MINE, DEVON.—CONDUCTED ON THE COST-BOOK SYSTEM.

This promising mine (now in 118 shares), to be divided into 1770 shares, at 6/- per share, extends over about 700 acres, and joins the western end of the well-known United Ashtonians Consols Mine. It is in full course of work, and making regular returns of £10—upwards of £5000, value of which has been disposed of. The present proprietors, being only four in number, are anxious to work the mine in a more effectual manner, and upon a more extended scale, having hitherto confined the operations to only one lode; they, consequently, offer one-half of their interest to the public as above.

For prospectuses and shares apply to Crossman, Sommers, and Co., agents, Mining Adventurers' Subscription Room, and Sole Registry Office for the Sale and Purchase of Mining Shares, 28, Threadneedle-street, London.

PANDRAINIQU QUARRY SLATE COMPANY, Bangor.

Registered provisionally, pursuant to the 7 and 8 Vic., cap. 110.

Capital £40,000, in 2000 shares, of £20 each.—Deposit £3 10s. per share.

DIRECTORS.

JOSEPH LAWRENCE BUTLER, Esq., 1, Dale-street, Liverpool.

JOHN FOWLER, Esq., 8, Rodney-place, Clifton, near Bristol.

ISAAC JOHN HORLOCK, Esq., Rocks, Marshfield, Gloucestershire.

RENEY BIRCHFIELD SWABEY, Esq., Great Cumberland-st., Hyde-park.

(With power to increase their number to seven).

BANKERS.

Messrs. Charles Hopkins and Co., 3, Bagent-street.

Messrs. Puget, Bainbridge, and Co., 12, St. Paul's Churchyard.

SOLICITORS.

Messrs. Richardson, Smith, and Sadler, 28, Golden-square, London.

SECRETARY.—Mr. John Henry Murchison.

OFFICE—19, ESSEX-STREET, STRAND, LONDON.

This company is formed for the purpose of working the Pandrainiog Slate Quarry, in the parish of Llanllwch, Carnarvonshire, the proposed purchase of which can be effected on terms most advantageous to the company.

The slate from the Pandrainiog Quarry is of the pure Bangor vein, and of the finest quality and colour. The quarry is situated about five miles from Bangor, and is a portion of an estate covering an area of about 350 acres. The great Holyhead road passes through this property, and connects the quarry with the wharf at Garth Point on the Menai Straits, and also with the Chester and Holyhead Railway, which crosses the turnpike road, at a point about three miles distant, the proximity to which will enable the company to convey slate into the Liverpool, Manchester, and Midland markets, with a punctuality and despatch that cannot now be attained through the medium of shipping.

The quarry, upon which a large sum has been already expended, has been opened for 20 years; and there is at present about 80,000 tons of marketable slate to be obtained from the metal now uncovered.

The property is held for a term of years, which will expire in 1903, without any royalty, and upon exceeding favourable terms.

Taking the value of 1 ton of slate at a price much below that which is obtained, and estimating the cost of getting, making, and cartage, and all the expenses of management, there will remain a net profit upon the capital of £40,000, equal to 20 per cent. per annum.

Parties desirous of taking the cancelled shares, may apply personally till the 15th day of June next, to any of the following gentlemen:—London, to the secretary, at the office, No. 19, Essex-street, Strand; to Messrs. Richardson, Smith, and Sadler, 28, Golden-square; or to Mr. James Lane, mining agent, 75, Old Broad-street, City; in Liverpool, to Messrs. D. and J. B. Nathan, or to Messrs. Sudlow, Brothers; in Manchester, to Messrs. Cardwell and Sons, or to Mr. Augustus Hahn; in Birmingham, to Mr. W. H. Collis; in Bristol, to Mr. Henry Dayrell, Clare-street; and in Exeter, to Mr. E. Tripp, 12 and 13, High-st.

Prospectuses, with the engineer's report, and engraved plans of the quarry, may be had on application at any of these addresses; and at the office of the *Mining Journal*, 26, Fleet-street, London.

BY HER MAJESTY'S ROYAL LETTERS PATENT.

HOT-BLAST.—THE NEW METHOD OF HEATING AIR FOR BLAST-FURNACES (which has been PATENTED by Messrs. DIXON, BULL, and BUDD), is now in ACTIVE, and most successful, WORKING AT THE YSTALYFERA IRON-WORKS, near SWANSEA, where it has been applied to six furnaces.

The plan is free from complication; the heating stove through which the air-pipes pass, are built adjoining the furnace; the flame of the furnace itself is drawn through the stove by a stack, and the air thereby heated without any expense of fuel or labour.

The patentees, being ironmasters themselves, know that no saving in first cost, coal, or labour, would be considered by the trade as a compensation for frequent repairs. They also know that in many instances the whole benefit of the hot-blast process, and in some instances more than such benefit, has been swept away by the cost and irregularity attendant on the repairs of the apparatus. But they can assure the trade that their apparatus is not liable to get out of order. At the Ystalyfera Iron-Works the hot-blast pipes that were put to work in October, 1844, are still at work and in good repair. They believe that there is nothing in the whole experience of the trade equal to this duration; but more than this, they are satisfied that where their improvements are carried out under their instructions, the stoves will last longer than the furnaces. At the Ystalyfera Iron-Works, near Swansea, six furnaces may be seen in operation, the blast being perfectly heated to the point of melting lead, by the plan of the patentees applied to five heating stoves. The dampers on the stacks afford the means of moderating the temperature, whilst the doors in front give a perfect command of the stoves, as the draft can be reversed, and a current of cold air introduced at a moment's notice.

The patentees now introduce their improvements to the notice of the Iron Trade, with the confidence arising from continued and successful practice. They preferred the delay of waiting until they were in this strong position, rather than to call the attention of the trade to their plan, whilst they were in a state to which all practical men have a well-grounded aversion—viz., that of an experiment.

The patentees confidently assure the trade that their patented improvements possess the following advantages:—

1. The first cost of erecting the apparatus is considerably less than that usually employed.
2. The liability to get out of repair is much less.
3. The temperature of the blast can be preserved higher and more equal.
4. £1000 is no cost of coal or labour—neither being required.
5. The working of the furnace is not at all interfered with.
6. The stoves can be readily cooled down without derangement of the apparatus, when cleaning or repair is required.

As the benefits arising from the adoption of the plans of the patentees amount to several shillings a ton of iron made (a most important consideration in these times of competition, especially where large quantities are made weekly), besides great comfort and regularity, the patentees respectfully invite the attention of the trade to the subject. In order to ensure an early and extensive use, they have resolved on making a very moderate charge only for their patent right.

As the hot-blast apparatus at present in use, requires such frequent renewal and repair, opportunities will occur in every iron-works, within a short period, of introducing the plans of the patentees without any, or with only a small additional, charge as dead outlay.

The patentees, therefore, congratulate themselves on being enabled to present to their brother ironmasters a plan by which all the benefits of the hot-blast process may be secured, free from the hitherto great drawbacks of current expenses and repairs. They have not obtained this cost without great cost and perseverance, and they look for a liberal support from the trade, now that they present their improvements in the manufacture of iron, free from all the doubt and risk of an experiment.

Every information will be afforded to intended licensees by J. Palmer Budd, Esq., of Ystalyfera, near Swansea, who will, if necessary, send an experienced person to superintend the construction of stoves, and the superintend carrying out of the plan.

TO MINE AND COLLIERY PROPRIETORS, SLATE QUARRY OWNERS, RAILWAY CONTRACTORS, IRONMASTERS, DEALERS IN GUNPOWDER, AND OTHERS.

MESSRS. JOHN HALL & SON, the PATENTEES AND SOLE MANUFACTUREES OF SCHÖNBEIN'S PATENT GUN-COTTON,

Respectfully state, that they are now prepared to SUPPLY the PATENT GUN-COTTON (compressed for the convenience of carriage), in round and square paper cases, of 4 lbs. each, packed in boxes, containing 50 and 100 cases each, at the price of 3s. per lb., for ready money.

Also, in tubes or cartridges of... 1, 1½, 2, and 3½ inches diameter:—
Containing... 2, 4, 6, and 8 ounces each, at the additional charge of... 1, 1½, 2, and 3½ pence, each tube or cartridge.

For blasting in slate quarries, paper tubes will be supplied, 3 ft. in length, containing 1 oz. of the Patent Gun-Cotton per foot.

4 OUNCES OF GUN-COTTON } equal in power to 24 OUNCES OF BLASTING GUNPOWDER,

As proved in mortars, similar to those used by the Board of Ordnance, for the proof of gunpowder.

OFFICE—23, LOMBARD-STREET, LONDON.

TO RAILWAY AND ELECTRIC TELEGRAPH COMPANIES.

BY HER MAJESTY'S ROYAL LETTERS PATENT.

REID'S PATENT PREPARED WIRE FOR ELECTRIC TELEGRAPHS, WIRE ROPE, AND FENCING.

The ADVANTAGES attending this WIRE are:—

1. That it may be had of any length.—2. That it is of uniform size, and, when galvanised, is of one uniform degree of softness.—3. That it is prepared for being galvanised by a process which leaves it wholly uninjured.

Hitherto it has been the practice, in cleaning wire to prepare it for the galvanising process, to immerse it in sulphuric, or nitric, acid, by means of which the wire has been much injured in its structure, from the acid not acting equally on all parts alike. By the new process this evil is entirely obviated, and the zinc coating is found to be more perfect.

For further particulars apply to the patentees, at 25, University-street, London, where specimens may be seen, and all orders will receive immediate attention.

CONTRACTS entered into and executed with promptitude.

BRETT & LITTLE, 140, Holborn-bars, London.

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